REPORT

OF THE

COMMISSIONERS OF FISHERIES,

IRELAND,

FOR

1853,

TO HIS EXCELLENCY THE LORD LIEUTENANT,

PURSUANT TO THE ACT 5TH AND 6TH VICTORIA, CHAPTER 106.

Presented to both Houses of Parliament by Command of Her Majesty.

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FOR HER MAJESTY'S STATIONERY OFFICE.
1854.

REPORT

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FISHERY COMMISSIONERS, IRELAND,

1853.

MAY IT PLEASE YOUR EXCELLENCY,

WE, the Commissioners for administering the Fishery Laws for Ireland, beg to submit to your Excellency the Report of the Inspecting Commissioners of Fisheries for the year 1853, which is so full and satisfactory that we think it unnecessary to do more than refer to it for all the detailed information which we could have communicated. This Report contains a general statement of the condition and progress of the Deep Sea and Salmon Fisheries of Ireland within the above period; and we beg your Excellency's attention especially to the interesting extracts from several communications received, relating to the artificial system of propagating salmon and fish of the salmon kind, which has this year been successfully introduced into this country by several parties interested in the Salmon Fisheries; and we have also pleasure in referring to the marked improvement which has taken place in the Salmon Fisheries throughout this country—a result which, partly at least, is attributable to the attention which, during the past two years, has been paid by the local Boards of Fishery Conservators to the vigorous enforcement of the laws for the regulation of the Inland Fisheries of Ireland. And we are happy to find that these laws are better appreciated and observed in proportion as they become more generally understood—a fact that tends to confirm the opinion expressed in our last Report, that success much more depends upon an energetic administration of the existing laws than in seeking for additional legislation, which need not be resorted to until the present laws are found to be defective either in principle or detail.

We have the honour to be
Your Excellency's obedient Servants,

R. GRIFFITH,
J. RADCLIFF,
H. D. HARNESS,
J. REDMOND BARRY, } *Inspecting Commissioners*
W. J. FFENNELL. } *of Fisheries in Ireland.*

Office of Public Works,
Dublin, 30th June, 1854.

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REPORT OF THE INSPECTING COMMISSIONERS OF FISHERIES FOR 1853.

Coast Fisheries.

It will be seen by the Abstract from the coast-guard returns, that there is a general concurrence in the belief, that the fishing of last year has been less productive than that of the preceding season. To the great diminution in the coast population, and the increased demand for agricultural labourers at higher wages, this may in a great measure be attributed; still, it is satisfactory to know, that in most places there is some improvement in the class of boats employed, and that the growing demand for fresh fish, produced by the facility of transit by railways, is still sufficient to induce increased exertion in all the principal ports where extensive dealers or curers are ready to purchase the fish as fast as taken. The great deterioration seems to have been in the rural districts along the coast; but complaints are made from several places, of the great difficulty found in procuring hands. A person who was formerly extensively engaged in the fisheries at Bantry states that he found it impossible to procure a crew of four men, as the people preferred devoting themselves to weed-cutting for manure, so very extensive is the culture of potatoes this season. At Kinsale the same complaints are made, and several well-found boats are unemployed for want of hands. The Inspecting Commander of that district states, that the great decrease appears to be in second-class boats, in consequence of the great emigration; but that within three years there has been some improvement, and that at present a better spirit exists than for some years past, as the demand for fresh fish has greatly increased, owing to the facility of railway communication. There are three curing establishments. This intelligent gentleman, who appears to have devoted great attention to the subject, states, that if capital were invested, and persons employed to manage the fisheries properly, the pursuit would be profitable and generally beneficial.

At Queenstown there has been a considerable decrease in the fishing establishment, owing to the number of boys who have gone into the navy and merchant service

At Youghal and Dungarvan the decline has been more than in most other places of their importance.

At Waterford there is still a considerable trade in fresh fish, for which the demand has greatly increased since the completion of the railway.

Along the east coast to Dublin, the last season is stated to have been unusually unproductive, excepting only the summer and autumn herring fishery, from Kingstown and Howth, in which the Cornish boats were, as usual, successful. In this fishery the Arklow boats also participated.

We are indebted to a communication from Mr. Miller, the Inspector-General of Fisheries in Scotland, for the following interesting fact:—

"One of our Scotch curers purchased, at a moderate price, and cured as under, herrings
" chiefly caught by Irish boats, which were well supplied with nets, after the home markets,
" and carrier-smacks had been supplied for the English markets:—

At Balbriggan, . . .	594½	barrels.
Howth, . . .	519	,,
Carlingford, . . .	263	,,
Drogheda, . .	20	,,
Total, . .	1,396½	,,

" The above gutted herrings were brought to Glasgow; found of fine size and quality, and
" afterwards chiefly sold in Belfast."

Carrickfergus seems to have been an exception to the general case of decline; and from this fact, as well as the cause to which it is attributed, a fair inference may be drawn, that steady industry, perseverance, and an exclusive devotion to the object, will in most seasons be rewarded The Inspecting Commander states:—

"The last year has been more productive at Carrickfergus than the preceding one. The boats are well found, and the men chiefly live by fishing at this place, of whom there are about 250; at all other parts of the district there are no regular fishermen, or men who earn a livelihood by fishing."

On the whole western coast the great inclemency of the last season has been remarked.

At Belmullet district, extending from Duna Head to Butter Point, the diminution in the number of boats and hands would seem quite incredible. There are no first class boats, and only 190 second class, with 676 men and boys, instead of the former establishment, which was stated to have been 962 vessels, with 3,376 men and boys. This clearly proves the great incorrectness of former returns, and that our efforts to procure a faithful statement have been in some degree successful The officer states:—

"The last year has been less productive on this part of the coast, which I do not attribute to the want of fish, but the population being fewer in number, and the cultivation of the land being much increased, the people having given more attention to it than in former

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years. I would only suggest, that if large boats were fishing on this part of the coast, I consider they would have full cargoes of dried fish by the latter end of April. This is proved by the success of the Dublin wherries, that have fished for several years on this coast."

At Galway we are glad to find the Report of the Inspecting Commander exhibiting a most gratifying contrast to his statements of the preceding year. In reference to the fishing establishment, he states:—

"At present they are improving very greatly since the Claddagh men have begun to trawl. The produce greatly increased, owing to an average of twenty trawlers being employed in the bay instead of *one*. Instances of conflicts much less frequent, and the habits of the fishermen more orderly and peaceable since the Claddagh men have been induced to trawl themselves."

This happy revolution, produced more by moral and natural causes than *by force*, presents one of the most favourable features that we are enabled to refer to. Facility of transport produced dealers, dealers produced steady demand and the absence of surplus supply, or what is commonly called a glut; and this state of things has tended more to extinguish the old established prejudices of this primitive community than either argument or physical force. Considerable aid was afforded towards the attainment of this object by liberal contributions from the proprietary and inhabitants of Galway, who have enabled the poor fishermen of the Claddagh to participate in the advantages of productive engines, which, when used under proper regulations, are now no longer repudiated.

Cod and Ling Fishery.

The season has been more than ordinarily unfavourable to this fishery, and the quantity of fish cured unusually small, so far as we have been enabled to learn, in the absence of any organized system for procuring authentic details from responsible parties; however, we know that the consumption of salt is greatly diminished; but that fact may be considered partly attributable to the great demand for fish in a fresh state; and it must be admitted, that notwithstanding the diminution in the numbers of boats and hands, our principal markets have been tolerably supplied, and that in the metropolis there has been no deficiency.

Oyster Fisheries.

We still continue to receive applications for licences to establish oyster layings, and have granted several, as will appear by Appendix. We have received the most favourable accounts of those that have been formed. The growing importance of this branch of our national resources cannot be too highly estimated. The bye-laws framed for the protection and improvement of the Oyster Fisheries of Cork Harbour will be found in the Appendix.

Refuse Fish for Artificial Manure.

Fully appreciating the advantages which may result from finding in an article of domestic production a substitute for guano, should the apprehended scarcity of that article occur, we caused queries to be generally circulated through the coast guard districts, which, with the answers of the inspecting commanders, will be found in the Appendix.

Salmon Fisheries.

In presenting our Report for this year, we have much satisfaction in being able to state, that a very material improvement has been experienced. The effects of the protection to the spawning fish and fry, rendered through the instrumentality of the Boards of Conservators, formed under the provisions of the 11 and 12 Vict., c. 92, are now manifest. In those districts where the Conservators have been attentive to, and active in the discharge of their duties, and have been judicious in the selection of competent and zealous Inspectors, results highly satisfactory have ensued; and although we are aware that in some instances too much apathy has prevailed, and in others a disposition to accommodate the views of particular interests by a seeming partiality in advocating regulations which could not be justified upon principles of equity, on the whole, we have the satisfaction to state, that the commercial value of the salmon fisheries of Ireland has attracted increased attention, and stimulated inquiry, by which more enlarged views are being entertained, and many persons whose interests are involved have been constrained by better experience to adopt those views, and yield to common sense and reason, in abandoning contracted notions with respect to individual monopoly; finding that denying a fair participation in the advantages to be obtained, to others who are entitled to share in them, produces effects not advantageous to themselves; and any one who considers the nature of salmon fisheries existing in rivers where public rights prevail, and private rights are generally local and limited in extent, must be convinced that, independently of a principle of justice to each party situated upon waters through which the fish must circulate for the purposes of reproduction, that it is impolitic for an individual as well as detrimental to the public, to seek to arrest an undue proportion for himself in their passage through his portion of the waters, by which all interested above him may be so damaged that they can have no interest in protection, while the stock for brood must ultimately become so much diminished, as finally to deteriorate the value of his own interest; and many instances might be quoted where individuals, not having been restrained, have effected this injury to themselves as well as to the public at large. The following extracts from the Reports of the Boards of Conservators, afford satisfactory evidence of the progress of improvement:—

District of Dublin—A. Brophy, Clerk to Conservators.—The fisheries progressing favourably; the take of spring fish more productive; very good prospects; the take of salmon more productive; 10*d.* to 1*s.* 2*d* per lb.; protection considerable; quantity of breeding fish greater; the quantity of fry greater.

District of Wexford—Sir T. Fetherston, Bart., Honorary Secretary.—The fisheries much improved; the take of spring fish much the same as last year; the prospects very good; the take of salmon better; 1*s.* per lb.; seven-tenths purchased for exportation; the protection has been much more effective; the quantity of breeding fish much greater than for the last eight years: the fry more numerous.

District of Waterford—A. N. O'Neill, Clerk to Conservators.—The fisheries much improved; the take of spring fish much better; the prospects most favourable; the take of salmon more productive; 10½*d.* per lb.; the protection much the same; the number of breeding fish greater; the quantity of fry much greater.

District of Lismore—W. H Parker, Clerk to Conservators.—The fisheries much improved; the take of spring fish more productive; the prospects very good; the take of salmon more productive; 1*s* to 1*s* 4*d*; the protection the same; the quantity of breeding fish nearly double; the quantity of fry as good.

District of Cork—J. P Carleton, Clerk to Conservators.—The fisheries improved; the take of spring fish very much more; the take of salmon more productive; 1*s.* per lb: the protection during the close season better; the quantity of breeding fish greater; the quantity of fry considerably more

District of Bantry—John Meara, Clerk to Conservators.—The fisheries progressing favourably; the prospect much better; the take of fish much larger; 6½*d.* per lb.; all purchased for exportation; the protection much the same; the quantity of breeding fish greater; the fry more numerous.

District of Kenmare—C. O Sullivan, Clerk to Conservators.—The fisheries improving; very few spring fish; the take of fish more productive; 5*d.* per lb.; very little protection; breeding fish increased; the fry much greater.

District of Killarney—J. Barry, Clerk to Conservators.—The state of the fisheries good; the take of spring fish more productive; the prospects fair; the take of salmon more productive; 1*s.* to 1*s.* 2*d.* per lb.; the protection about the same; breeding fish more numerous; the quantity of fry less.

District of Limerick—J. B. Alton, Clerk to Conservators.—The fisheries greatly improved; the take of spring fish more productive; the prospects very good; the take of salmon much greater; 1*s* 4*d.* per lb.; chiefly purchased for exportation; the protection greater; breeding fish more numerous; the quantity of fry greater.

Extracts from Report of the Limerick Board of Fishery Conservators for the Year ending 31st December, 1853.—It is with no ordinary feelings of gratification that we find ourselves enabled in this our third year of office, to announce to the public that the present state of our district is, in every respect, most satisfactory. The take of salmon during the past season far exceeded in amount the expectation even of those who were most competent to estimate the benefits that were certain to result from the strict enforcement of the protective provisions of the law during the two preceding years. A marked improvement was also observable in the average size and weight of the captured fish. This truly important advantage is solely attributable to the protection afforded to the parent fish on their passage to the sea after spawning. Our future prospects are cheering in the extreme, as the stock of breeding fish at present occupying our spawning fords is immensely large. It is gratifying to receive such early and conclusive evidence of the propriety of the late curtailment of the open season, effected by the Commissioners of Fisheries, in accordance with the representations of the Board.

The weather and the state of the water during the present spawning season have been as favourable as could be desired—no heavy floods having occurred, such as those which characterized the winter of 1852, and of the effects of which, on the newly-deposited spawn of that year, some experienced fishermen were apprehensive.

The price of salmon in our market during the past season was not in the least affected by the increased supply. Spring fish realized to the captors from 2*s.* 4*d.* to 1*s.* 6*d.*, and peal from 1*s* to 8*d.* per lb. A very brisk competition for the produce of our Fisheries was maintained throughout the entire season, by agents from the principal dealers in Dublin and all the large towns of England. Increased supply appeared only to stimulate the demand, and, therefore, we may safely calculate on a continuance of the prices which have hitherto been received.

We have much pleasure in being able to state, that offences against the Fishery Laws have greatly diminished in number, owing, no doubt, to certainty of detection and punishment, consequent on the vigilance of our bailiffs, and the assistance afforded to them by that invaluable force, the Constabulary.

The want of fish-passes over several mill-weirs in our district tends seriously to obstruct the ascent of fish to some of our best spawning fords, and exposes them to innumerable predatory attacks while vainly endeavouring to surmount those barriers. We have already directed the attention of the Commissioners of Fisheries to this important subject, and we have reason to hope that measures will soon be taken to remove this very just cause of complaint.

It is undeniable that under the present system of protection our inland fisheries have arrived at a position of commercial importance, and it therefore becomes the duty of the state, and of every class of the community, to aid their utmost development, as no mean auxiliary towards that improved condition of our country, of which numerous indications are each day becoming apparent.

District of Galway—S. Cross, Clerk to Conservators.—No improvement in the fisheries; the take of spring fish more productive; the take of salmon better; 7½*d.* per lb.; protection the same; the quantity of breeding fish much less; the fry more numerous

District of Ballinakill—P. Caulfield, Clerk to Conservators.—The fisheries much improved; the take of spring fish more productive; the prospects most favourable; the take of salmon more productive; 6*d.* per lb.; purchased for home use; the protection the same; breeding fish more numerous; the quantity of fry much greater.

District of Bangor—Michael Gallagher, Clerk to Conservators.—The state of the fisheries most favourable, the take of spring fish not so numerous; very good prospects; the take of salmon more productive; 4*d.* per lb.; very little purchased for home use; the amount of protection much greater; the quantity of breeding fish greatly increased; the fry far more numerous.

District of Ballina—William Little, Clerk to Conservators.—The fisheries slightly improving; the take of spring fish not more productive; too early to give an opinion as to the future prospects; the take of salmon much the same; 4*d.* per lb.; the same amount of protection; the quantity of breeding fish rather less; too early to form any opinion as to the quantity of fry.

District of Sligo—T. Russell, Clerk to Conservators.—The fisheries improved; the take of spring fish more productive; the prospects much better; the take of salmon much more productive; 6*d.* per lb; protection good; the quantity of breeding fish increased

District of Ballyshannon—J. Lipsett, Clerk to Conservators.—The state of the fisheries appears good; the spring fishing better; the prospects very good; the take of fish better; 5*d.* per lb.; protection improved; quantity of breeding fish greater; fry more numerous.

District of Letterkenny—J. Watt, Clerk to Conservators.—The fisheries are improving; the take of spring fish more productive; 9*d.* per lb.; protection the same; breeding fish rather less; the fry not so numerous.

District of Ballycastle—G. Morton, Clerk to Conservators.—The fisheries rather better; the take of spring fish better; the prospects good; the take of salmon much better; 1*s.* to 7*d.* per lb.; the amount of protection much the same; breeding fish more numerous; quantity of fry greater.

The question of the artificial production of fish has engaged much of the attention of the Inspecting Commissioners They commenced practically to illustrate it by procuring from the Messrs. Ashworth (to whom Ireland is indebted for its first introduction to this country), some salmon fry, which were produced for them at Oughterard, in Galway, under the direction of Mr. Ramsbottom of Clitheroe. These tiny fish were placed in a glass tank at the Great Industrial Exhibition of 1853, in Dublin. They attracted great interest, and were specially noticed by Her Majesty and the members of the Royal Family who accompanied her. They are still preserved, and growing and thriving well in the Fishery Office, and many persons visit them, and are anxiously watching their progress. We beg to offer a few remarks upon this experiment. We feel convinced that it may produce many valuable results if properly and judiciously carried out; but, doubtless, in its infancy some failure in substantial advantages may be anticipated, which should not, however, discourage those who adopt it from persevering, until they arrive at a practical knowledge of the modes of proper application and management by which it may become available for increasing the value of the salmon fisheries. It occurred to us that a great desideratum connected with this question would be, ascertaining if possible, whether after the young fish had been produced they might not be kept within the control of the person whose skill and industry would entitle him to the advantages which might be derived; and as the natural habits of the salmon require migration to the sea to become valuable for the use of man, involving the uncertainty of returning to his rightful owner who reared him in the element alone suited to his infant state, the Inspecting Commissioners having obtained the sanction and co-operation of the Board with whom they are associated, had prepared at Kingstown, a place suitable for this experiment. This may be termed a "sea pond," 200 feet long by about 50 feet wide; at low water its depth is about 6 feet, a rise of 6 or 7 feet occurs at every tide flowing in through a grating placed across the entrance to confine the fish within. We took fry from the fresh waters of the Liffey and Bray rivers at the proper age, and migratory state, and have transferred them to this pond, where they can now be seen daily. They are watched by many persons anxious for the result of this experiment, and appear to be thriving well, and have increased considerably in size; they were placed in this pond on the following dates:—

SALMON FRY DEPOSITED IN SEA POND AT KINGSTOWN.

1854.—April 22.—	9	Salmon Fry,	taken out of	Liffey River, near Lucan
„ „ 27.—	24	„	„	Bray River, below bridge in brackish water.
„ May 3.—	10	„	„	Liffey, near Lucan.
„ „ 5—	12	„	„	Bray River.
	12	White Trout,	„	
„ „ 8.—	5	Salmon Fry,	„	Liffey.

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Very small fish pass in through the grating from the Harbour, and the young salmon are seen feeding upon them. If this experiment should succeed in demonstrating that salmon may be thus successfully kept under control until they attain to a size rendering them valuable in an edible point of view, innumerable enclosures may be made around the coast, varying in extent, according to circumstances, and by these means the artificial production of salmon may become of vast importance.

The following extracts from communications received will show to some extent how far the artificial production has progressed.

No. 1.

ARTIFICIAL PROPAGATION OF SALMON.

(*From the Perthshire Courier of December* 8, 1853.)

The operations in the river here are going on very successfully for the above purpose. The boxes for hatching are in number 300, which will contain upwards of 400,000 ova, and fully one-half of them are already filled. On Saturday last, from five female and one male salmon, got below a ford near the mouth of the Almond, about 50,000 eggs, and on Tuesday upwards of 100,000 eggs, were impregnated and deposited in the boxes; and from this small portion of the river it is expected that as many fish will be got as will fully stock the boxes. This will be done without in the least injuring the natural supply of the river, as a fresh set of fish are found to occupy the ford as soon as the former set retire from it. In a year like this, especially when so many are on the fords, it will be a positive benefit even to the propagation in the natural state; because it is well known that when too many fish are on the fords they obstruct each other, and are so disturbed that a very small portion of the ova is impregnated, and the remainder is consequently useless. Thus, along with numerous trouts and water ouzles that hover round the spawning bed, and swallow the ova as food as fast as it is dropped, there is not five per cent. of what is deposited that comes to life. Besides, new sets of fish succeed each other on the ford, and dig up and scatter what has been deposited by the former occupants of the beds. In the experiment now going on none of the ova will be lost, and the old salmon is not in the least hurt by the operation. Mr. Ramsbottom, from Clitheroe in England, who has conducted very extensive experiments in pisciculture both in England and Ireland, has the charge of the operations here, and so conducts them, that not one of the fish is in the least injured. Last year, out of many thousand eggs which he planted for an extensive proprietor of fishings in England, only two were unproductive, and the young fry, the produce of the eggs, are now thriving and well. It therefore, in all probability, will turn out to be a very great benefit to the salmon fisheries, and become of importance to the nation. It has been observed, that when fish are very plenty in the rivers during close time, a plentiful crop does not consequently follow; because by the fish disturbing each other, and also the disturbing of the beds by new fish afterwards coming on. the ova is thus destroyed. When we consider, therefore, that this small ford in the Tay will, by great care in the culture, supply as many eggs as will fill 300 boxes, and produce from 400,000 to 500,000 young fish, what would the many hundred fords or spawning places in the magnificent Tay and its tributaries produce if so cultivated? The French are quite alive to this, and are making pisciculture a matter of national importance. Therefore, whether successful or not, the experiment is worth trying. We have heard that in the Town Council a magistrate has expressed himself, that were he armed with the power of a Justice of the Peace he would put a stop to these operations under the Act of Parliament for the protection of the fisheries He would stretch the *letter* to destroy the *spirit* of the Act. The operations going on are in the very spirit of the Act, and according to its title—"For the preservation of the salmon fisheries," and no injury whatever can follow from these experiments. They are conducted under the sanction of the proprietors of fishings in the Tay, and it is hoped they will not be interrupted. In connexion with the above we may state that we have seen a drawing of fish thus propagated at Galway. It was taken from one of the breeding ponds there, in which are being reared no fewer than 20,000 at this moment. The specimen represented in the drawing is nearly four inches in length, of most perfect symmetry, and seven months old.

(*From the Daily Mail of December* 6, 1853.)

The ponds for this purpose are situated on the river bank near Stormontfield, the spawning boxes being sixteen feet above the summer level of the river. The water which supplies the ponds is taken from Stormontfield lade (but owing to the impurity of the Tay during spates, a supply is also to be taken from a neighbouring spring) by a pipe with a valve into a filtering pond; from thence it is carried by a canal along the upper end of the spawning boxes, through which it runs. These boxes are eighty-four feet long by one foot six inches broad, and three feet deep. They are placed with a fall of six inches, so as to allow the water to flow freely through them, and are partly filled—first with a layer of fine gravel, next coarser, and lastly with stones somewhat coarser than road metal. In distributing the ova, it is gradually poured out of the vessel which holds it, at the upper end of the box. The water flowing downwards carries it amongst the stones, under which it settles down; and by gently applying a few buckets of water at the upper end of the boxes, the ova is taken down and distributed equally amongst the gravel. When the young fry are in a proper state they are allowed to escape into a pond situated at a foot lower level than the boxes, where they will be fed, and allowed to remain until such time as they are in a fit state to be turned into the river. This pond is not yet made, but will be finished by the time the fry are hatched. Great care has been taken to prevent any animal entering with the water that would prey upon the young fish. Mr Ramsbottom, from Clitheroe (who has experimented successfully for the Messrs. Ashworth on the Lough Corrib waters, in Ireland), has the sole management of the Tay ponds. Saturday was a remarkably fine day for the season, and we were privileged in being present at the operation of stripping the fish. When we arrived Mr. Ramsbottom had already got about 15,000 ova in round tin cans, and he showed us an oval-shaped tin box with a lid, which contained a small male fish swimming in water, which he said was waiting for his mate; presently the net was shot in the Tay at the mouth of the Almond, when two fine female fish, ripe for spawning, from 18 to 20 lbs. weight, along with a small male fish, were caught. Mr. Ramsbottom having taken the largest female in his left hand, drew his fingers firmly down both sides of the belly of the fish, when the ova flowed in a stream into the tin box formerly mentioned, in which there was a few inches of water, the fish was instantly returned to the river, and after a short time sailed off as if nothing had happened to it. After the ova had been washed by water being poured on and off—care being taken never to allow it to be exposed to the air—the male fish was brought (which all this time had been in the river under a fold of the net) and manipulated in the same manner as the female—only a small portion of the milt being required. On the milt being shed, a slight change was seen to take place in the colour of the ova, which became paler. Water was again poured on and off, when the operation was complete. The ova was then poured into round tin cases and carried to the ponds. When we left the river side upwards of 40,000 ova, in fine condition, had been obtained. We observed that a few of the ova, after impregnation, turned white, instead of being a fine salmon colour. Mr. Ramsbottom said they were barren ova. In the month of March the fry will have burst their shell, when we hope to report further.

No. 2.

(*From the Perthshire Courier, Thursday, December* 22, 1853.)

The interest excited by the experiment now going on in the Tay may be deemed not only of a local, but of a national nature. There is scarcely a newspaper throughout the kingdom which has not favourably noticed the undertaking. As a proof of the interest felt in the subject, we may mention that the Duke of Sutherland's factor came expressly from the far north, a few days ago, by his Grace's orders, to visit the ponds at Stormontfield lade, and report thereon; and on Thursday the 15th instant the Secretary of the Royal Society in Edinburgh came for a similar purpose, and both gentlemen expressed themselves equally satisfied and delighted with what they witnessed. They intend to return in a few months, when the young fish have burst the shell and sprung into life. Mr. Ramsbottom returned to England on Wednesday the 14th instant, after having seen the spawning boxes almost filled—350,000 ova being deposited in half the time that his most sanguine expectations had ever calculated on, and all from one small spawning bed in the Tay, just below Scone Palace. He said that in his opinion the Tay was one of the finest breeding streams in the world, and that it would be presumption to limit the numbers that might be raised there were the river cultivated to its capabilities. It is now beyond a doubt that a fishless river can be stocked artificially with any kind of fish, Mr. Ramsbottom being now engaged in stocking rivers in Scotland (for the Duke of Montrose) where salmon was never seen before. "Natural history informs us that the production of the female salmon is indeed enormous, and it is furthermore shown that the artificial extraction of eggs is not injurious to the fish. It has been ascertained that a salmon of 5lbs. weight yields 5,000 eggs, and one of 20lbs. about 20,000; thus 100 fish will produce 1,000,000 eggs, which, by protection from their numerous natural enemies, become fish." We may also observe that some weeks ago the Duke of Roxburghe sent the Superintendent of the Tweed River Police to examine and report on the plan adopted here; and we find that his Grace is now constructing a pond on the Slodrig Burn on the Tweed, on the same principle as that at Stormontfield lade. The works are stated to consist of four boxes, twenty-four feet long by eighteen inches wide, divided into compartments six feet long and twelve inches in depth; they are expected to be ready for the reception of the ova in a very short time. In our paper of last week it was stated erroneously that the number of ova sent from the Tay to Galway was 70,000, whereas we have since learned that the correct number sent was only from 2,000 to 3,000. The following curious fact in connexion with this subject will be read with interest. On Tuesday the men employed in taking the breeding fish secured a whiting about three-quarters of a pound in weight, when they observed salmon ova coming out at his mouth, and he was brought to the office of Mr. Buist for examination. On being opened, upwards of 300 impregnated salmon ova were taken from his stomach quite undigested. It may be therefore fairly presumed that this youngster had taken this quantity to his breakfast; and if he dined and breakfasted in the same style each day during the breeding season, it is difficult to estimate the expense of his keep. Such is the amount of loss of impregnated roe in one morning from one trifling fish. What must it be throughout the season from the various

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enemies that it has to encounter! Surely facts like this will convince all of the necessity of giving the breeding of salmon that protection which any other valuable property invariably receives. Mr. Ramshottom is now propagating salmon on the river Dee, near Chester.

No. 3.

ARTIFICIAL REARING OF SALMON.

(*From the Perthshire Courier of January* 12, 1854.)

From time to time we have had the pleasure of directing the attention of our readers to this interesting subject, and to-day we are happy to record another instance of the interest excited in high quarters, by a communication received by Mr. Buist, the other day, from the Commissioners of Fisheries in Ireland, dated "Office of Public Works, Dublin," and sent on "Her Majesty's Service," requesting Mr. Buist to send up to Dublin a small quantity of ova from the Tay to enable the Board to conduct the experiment of the "Artificial Rearing of Salmon" to a certain extent under their own eye; and we were much gratified to learn that Mr. Buist has been enabled promptly to meet their views by forwarding, yesterday, a considerable quantity of ova carefully packed in cases, which, we have no doubt, will arrive in good order. The above communication shows that this influential body are taking up the subject in right good earnest, and are determined to prove the experiment. We are also glad to learn that the spawning-boxes where the ova are deposited at Stormontfield-lade, have been with great care kept in a running fluid state, notwithstanding the intense frost, and that this week, by the kind permission of Lord Mansfield, a stream of pure spring water has been conducted into them, which has kept the water several degrees warmer than that in the adjoining lade, and had even the effect of melting the ice of considerable thickness on the surface of the filtering pond, and finding its way under the ice.

No. 4.

ARTIFICIAL PROPAGATION OF SALMON.

(*From the Perthshire Courier of March* 30, 1854.)

The experiment of propagating salmon artificially in the Tay is progressing most satisfactorily. The ova in the boxes at Stormontfield have not, however, yet exhibited manifestations of life, but as affording a strong—in fact a certain presumption that they will do so—we may state that Mr Robert Buist, Superintendent of Fishings, took a quantity of ova from the boxes there on Wednesday week, which he placed in his office, and, from its high temperature, the ova has rapidly germinated into life. In fact, the young salmon may be seen in his office flitting about in a small basin, with the greatest spirit and agility, apparently quite at home. We may add also, if the present mild weather continues, it is confidently expected that in the course of ten or twelve days hence, there will be nearly 350,000 salmon fry in the boxes. It is very much to be regretted that sufficient ponds have not been constructed for their reception; and the consequence will be, that the fry will have to be sent into the river in a comparatively short space of time.

No. 5.

(*From the Perthshire Courier of April* 6, 1854.)

Under this head several articles have appeared in our paper for some months past; and the extensive experiment now going on at Stormontfield has excited much attention in those who are connected with the fishings, or have an interest in the natural history of the salmon.

As these experiments are now arriving at an important stage, viz., the hatching of the eggs, and the development of the young fish, it may be as well to take a rapid retrospect of the operations, which have been carried on thus far with the most complete success.

The artificial spawning of the parent fish began, under the able and skilful superintendence of Mr. Ramsbottom, of Clitheroe, on the 23rd November last.

After several trials of stations in the Tay, Almond, and Earn, in view to procure fish sufficiently ripe for the purpose, at last a ford in the Tay, near to Almond mouth, was successfully fixed on to make the attempt at artificial breeding in the Tay. This ford was at a convenient distance from Stormontfield, where, through the kindness of Lord Mansfield, and Mr. Spotteswoode, the tenant of the Bleachfield, a large park was got, with a command of water from the Mill Lade. In this park 300 boxes were laid in twenty-five lines, with walks between each row, and each box calculated to contain 1,000 ova. There were also filtering beds and canals at the head and foot of the rows, which canals were also used as breeding beds.

The operations of spawning the fish and filling the beds began on 23rd November, and finished well, the whole being fully stocked on the 23rd December. It was calculated that above 400,000 ova or eggs were by that time deposited. This was done so dexterously and tenderly, so far as the parent fish were concerned, that none of them appeared to be the least injured after undergoing the operation, which we described in former articles in this paper; and the whole of the ova so taken would, to all appearance, have been lost in the river, the ford itself being planted with ova in the natural way so thickly that it resembled a well-harrowed field newly sown. The fish could not have got to other fords, as there were none unless some miles farther up, and the fish were so ripe they could not have reached them in time to spawn with any degree of success. It might therefore be reckoned that, unless this quantity had been put in the boxes, almost the whole would have been lost to the river.

It will thus be seen that the first ova had been about 130 days in the boxes, and the last 100 days. The first planted are now getting into life, and the others have every appearance of being so in a few days. As the whole, with few exceptions, are looking very healthy, we may therefore expect in a short time to see the whole fry swimming about in the ponds.

In the hatching, much seems to depend on the temperature of the atmosphere, as a certain quantity of ova which were deposited under a spring coming from a rock at Barnhill, came into life when taken into a house, some fifty, and others, sixty days after. In France the ova came to life in sixty days; the earliest at Stormontfield in 120 days.

So far, therefore, as the experiment has proceeded, it has proved completely successful, and does great credit to Mr. Ramsbottom, who conducted the operations at first, and taught the men how to conduct them afterwards. With great knowledge and tact he selected the fish that were fully ripe, rejecting the others, and returned them carefully into the river. So successful has he been in selecting the eggs, that apparently not one in forty has been addled; and the success as a whole, so far as bringing the fish into life, is put out of doubt.

We think it but justice to him to state this, as whole yards of type have been printed in *Bell's Life in London* and other newspapers, to prove that the whole would turn out a failure. They might have waited the results, and given Mr. Ramsbottom and the experiments fair play.

A clever and well meaning writer in London is now printing notes on the British fisheries, wherein he notices the work at Stormontfield. He, however, seems not to know much about the matter himself, but trusts too much to others, and argues on some disputed points as if they were settled facts. He says, that in five days after leaving the egg, the young fish grows as large as a man's little finger, immediately proceeds to the sea, and returns the same year as a grilse. Now it has been found both by observation and by Shaw and Young, that it only grows to par the first year. And we have now before us some fish that have been a fortnight hatched, moving about briskly at times, but with the bag unabsorbed, which, by all accounts, will take five or six weeks to become a perfect fish, and then only about an inch long. The smolts are now going downwards to the sea, and the small things are now only hatching; so that it is absurd to say, that these tiny, delicate things can this year go from the waters upwards of forty miles after becoming smolts the first year. But it is wasting time to contradict such exploded doctrine.

Mr. Todd Stoddart, who has written so much, and so well, on the natural history of the salmon, has lately published in the *Kelso Mail* some very candid and sensible remarks on the experiments now under our notice. He has raised a question that will require some consideration—viz., What are we to do with the fish after being hatched, as there are no sufficient means to keep and feed them—the ponds intended for that purpose being by far too small? Now there is too much truth here, as all we bad allowed for this will not contain one-tenth of the young fish. There seems, therefore, nothing for it but to allow all we have no room for to go into the river, and feed what we can, and make observations on them for guidance in future years.

Our breeding boxes far exceed those in France as to size or contents, and it would take acres of ponds to feed our fish as they have done.

We must therefore allow our tender nurslings to take their chance against their many enemies in the river. Their name is legion, and even their own kind devour them; a par is even a bait to catch a salmon, and the year-old pars now in the river will devour their infant brethren of this year's hatching. Poor things, they are ill able to encounter—

> "The springing trout, in speckled pride;
> The salmon, monarch of the tide,
> The ruthless pike, intent on war;
> The silver eel, and mottled par."

Nature, however, will protect them from many of the last, as the pars are now proceeding in myriads to the sea—with their mottled coats covered with silver livery—to return, as grilses, in course of next summer.

The question may now be put—What good has all this expensive experiment done?

It may shortly be answered—all these 400,000—or, making allowance for loss, at least 350,000—creatures have been brought on to a certain stage, which otherwise might have been almost all lost to the river.

It has also been shown how the eggs of salmon may be safely taken, and sent to supply seed to other rivers where salmon were never before, or if so, worn out. It will also show, where ground for hatching can be conveniently got near spawning fords, to what a great extent the natural means of hatching may be increased.

It has been so far attended with success here and in Ireland; also in the Tweed the experiment has been successful, and there the fry are now coming to life.

Whatever success it may have in a commercial point of view, much light will be thrown on the natural history of the salmon, and much learned as to how the breed of these valuable fish may be promoted, and their number greatly increased.

ROBERT BUIST.

APPENDIX.

Report of Inspecting Commissioners of Fisheries for 1853.

No. 6.

We have been favoured with a copy of the following interesting letter addressed to a friend by the Honorary Secretary to the River Dee Fishery Association:—

Dear ——, You ask me to give you "a full, true, and particular account" of the manner of our proceedings in the salmon nursery which we have established at Overton, and its probable results. I will endeavour to do so; and though no very new feature has transpired in the course of our experiment, a recital of the local difficulties we have had to contend with may not be without its use, as most undoubtedly the science is yet in its infancy, and even "doctors disagree" in some of its first principles.

About the end of November last, having had some correspondence with Mr. Ashworth (who has established a similar nursery in Galway), he came over to Chester at my invitation, and the following day we went to Overton to see Mr. Peel, and select a site for the experiment. We found what appeared to us a very suitable spot close to Overton, and received Mr. Peel's full assent to our proposals. On the 2nd of December I again visited Overton with Griffith Lewis (the person I had sent for to conduct the operations), when I was induced to think from information I then received, that the spring we had selected was not to be depended on. We spent the whole day in walking over the estate, accompanied by parties who knew the country, and at length determined on making use of a spring near Overton Bridge, about 100 yards above the river. It was unfortunate that at this stage I was not shown a very superior spring in an adjoining field, there being some objection in the opinion of Mr. Peel's agent to my entering upon that ground, which was in another tenancy. As it was, the spring we selected appeared to be very sufficient, and its defects were not manifest until our operations were far advanced. I then engaged two men accustomed to netting (who were keepers in the employ of the Association,) to assist Griffith Lewis in his work; and they immediately commenced netting on the fords, to take the spawning fish. In the mean time I got made and sent over from Chester twenty boxes of red deal, six feet long by one foot six inches wide, each of them capable of holding about 2,500 ova.

On the 14th December, having received information that a quantity of spawn had been obtained, I went over and filled the first box with ova. I directed the men to lose no time in laying down and preparing the rest of the boxes with gravel, and in filling them with spawn in the same way as the first, following my instructions, and, as much as possible, the system laid down in one or two piscicultural pamphlets with which they were supplied.

On the 20th, Ramsbottom, of Clitheroe, who had been sent for, came from Perth, and we proceeded to examine the state of the boxes as far they had gone. We found four boxes laid, and the spawn looking healthy; but the men complained of the difficulty there was in obtaining it; the river being low and the fish not easily caught. Ramsbottom said, if we could not get it from the fish, we must get it from the river; and having put together a riddle made of deal boards and pierced zinc, we proceeded to dig up some of the spawning beds (or "dyches" as they are here called), and with considerable labour obtained as much spawn as filled two boxes. I may here remark that this plan is of very doubtful expediency at any time, and was only adopted on this occasion as a *dernier resort*, Ramsbottom and myself being very anxious to get the boxes filled at any cost. I certainly believe that had this spawn been left undisturbed in the river, a very large proportion would never have germinated; had it even escaped the casualties of flood and frost, to which it would afterwards have been subjected, it was most of it so deeply buried in gravel, that it must have perished irretrievably, and at the time it was placed in the boxes I regarded it as so much saved. But the result did not prove so. The whole of the spawn thus obtained, though for some time it appeared to do well, eventually perished; and those boxes being emptied, were refilled with spawn, taken direct from the fish.

On the 22nd, at 3 a.m., we proceeded to net for fish, and were singularly unfortunate, as we captured before daylight nine fine salmon, all of whom were either males or female fish which were not ready for spawning. I have read a good deal of nonsense, written by people who evidently know little or nothing about the matter, as to the harm this netting does, by alarming the fish, and causing them to forsake the spawning ground. Now we netted on this occasion one ford, three successive times, and each time of going over it took a fish, so little had the passing of the net scared them. Indeed, when the fish were turned loose, although we first carried them a short distance up the river to avoid catching them a second time, they all steered straight down for the place where they were taken. One of these was a large female fish, which was marked near the back fin by a white scar, apparently the result of a wound; she was full of spawn, and Ramsbottom had her in his hands for, I think, ten minutes, trying if he could obtain it, as he was exceedingly anxious to obtain some; but the fish not being far enough advanced, he was unable to succeed, and she was turned into the river. Three weeks afterwards Griffith Lewis again took this very fish *in the same spot*, and obtained all the spawn, which filled two boxes; she was then again released, and I cannot help hoping I may see her again at Overton next year. So much for the *alarm* the fish experience from netting.

Before our boxes were all quite filled, but when too late to remove them, we began to experience difficulties from a want of purity in the water by which they were fed. Springing, at a very short distance from the boxes, and being apparently a very pure run of clear water, it was not deemed necessary to filter it; but a small pool through which it ran, sufficed to breed weed and moss, and when the frost went and the weather became milder, a green slimy deposit accumulated in the boxes to a mischievous extent, covering the gravel, and choking the spawn so as to endanger the whole of it; it became necessary to clean the boxes by sweeping them with a birch broom once or twice a week, and eventually every day, to get rid of this nuisance; and I am convinced that this disturbance of the water, though necessary under the circumstances, was in itself prejudicial; great quantities of ova perished, and at one time I almost despaired of saving any of them. On the 25th of March, however, 101 days after the ova were laid, I received the gratifying intelligence that some of them were hatching. I lost no time in visiting the boxes, and found the fish coming to life in three of them. Prepared as I was to be pleased with the circumstance, I cannot express the gratification it gave me to see our hopes thus realized; nor had the representations I had seen of the young fish in its first stage of existence at all prepared me for so beautiful a little specimen of animal life; its slight, fish-like, transparent form, of a delicate salmon colour—the bag depending from its throat, deprived of its apparent deformity by the brilliancy of its scarlet hue—its lively, rapid, though not continuous, motion, and the sense that in that little, half-formed, tadpole-like being was the germ of a future salmon, all contributed to give an interest to the realization of this experiment, which would have been sufficiently strong, even if it had not been for the hundred and one days' suspense which attended its consummation. The fish are now daily coming to life, some having shown themselves in all the boxes.

We have had great difficulty in making a pond in which to receive them. Two or three sites originally fixed on were abandoned for various defects, and the spot finally selected united almost every desirable qualification, but the soil has proved so much more porous than was anticipated, that we have been at great trouble and expense to render it water-tight. This difficulty is now, however, overcome, and the reservoir will, I trust, in a few days be complete. It is fed by several springs, one of which rises in considerable volume from a gravel bed, and will be the one made use of to supply our boxes for the next hatching. As it will issue from its source at once to the boxes, no filtration will be necessary, nor any vegetable accumulation possible.

I have about 500 ova deposited in a box in my garden here, which have been there seventy-two days, and most of which appear healthy. These I have had for the sake of daily observation, and to see how small a run of water might be sufficient to raise them. The little rill I obtain from a filtering box of gravel, through which it passes, averages a gallon in eight minutes; and all the spawn which has remained *undisturbed* looks healthy. Some have perished, I believe, solely from being handled; and I must say, the result of my experience, so far, is directly at variance with former writers on the subject, who have declared that it might be handled and examined with impunity.

You have now one half of what you asked for—viz., an account of our proceedings at Overton; the other half—viz., their probable result—I must decline saying any thing anent. It would take up too much room, require a summary of a vast variety of adverse opinions, and, after all, be purely hypothetical. I prefer devoting myself to the practical experiment, and leaving the result to be proved by events. If we succeed in doubling the yield of salmon in the Dee, we shall have wrought a good work; if we fail, our disappointment and regret will, at all events, bear no tinge of self-reproach.

I remain, dear ——, yours truly,
WILLIAM AYRTON.

Chester, 15th April, 1854.

No. 7.

I.—ON THE IMPREGNATION OF THE OVA OF THE SALMONIDÆ. By JOHN DAVY, M.D., F.R.S. Lond. & Edin., Inspector-General of Army Hospitals.

From time to time it has been asserted, that the function of impregnation of the ova of these fish is performed after the manner of that of the cartilaginous, viz., before exclusion. The instances related in proof are commonly of a vague kind, and such that little credit can be attached to them. Recently a more precise example has been adduced,—how the ova of the trout, taken from the abdomen of the parent fish, and placed in a "running stream" apart, included in a perforated box, in due time were hatched, producing young fish. The particulars of the experiment, and the result, were published in the spring of last year, and in more than one of the provincial papers; and Dr. Robertson of Dunkeld was named as the institutor and reporter of the trial.

Considering the manner in which this statement was made and received, and the practical conclusion adduced,—that no longer any trouble need be taken in the artificial mode of breeding to obtain the milt to apply to the roe, I have thought it worth while to give the subject some attention, on the supposition that the result, as stated, may have been accurate, being, as it appeared to me to be, within the limits of possibility,—though I cannot say, keeping in mind the structure of the male and female fish, and all the information hitherto collected respecting the manner in which the generative process is carried on by them—that it is within the limits of probability.

I shall first briefly notice some trials which have been made, and with a view to determine the question.

Mr. Shaw, in his valuable paper on the Development and Growth of Salmon Fry, published in 1840 in the Transactions of this Society, describes how, in two instances, he obtained negative results in experiments on mature ova of the salmon which had not been mixed with milt after exclusion, though in all other respects placed and treated like other ova from the same fish,—ova which had been mixed with milt after their exclusion, and were thereby impregnated, and rendered prolific.

Mr. Young, in his Natural History of the Salmon, gives an account of some experiments with a similar negative result. In page 17, he states, "We have often experimented on the ova of fishes, merely to arrive at facts. We have impregnated one part of the ova of the fish with milt, and have left part unimpregnated, and then deposited both parts in the same stream, at the same depth, and in a current of exactly the same velocity. But never, in any one instance, did we find one grain of the unimpregnated part productive, while the other portion that was impregnated with the milt never failed to produce fry in due time." He adds, "This has been frequently tried, and has at all times proved the same."

Mr. Ashworth, by whom the production of salmon on a large scale has been so successfully carried on in Ireland, informs me, in a letter with which he has favoured me, of a similar negative result,—How Mr. Ramsbottom, in his employ, "took a female fish (a salmon) and extracted a quantity of eggs; then placed them in a box alone, without impregnating them with the milt, and none of them came to life;" and how "he took the remainder of the ova from the same fish, and impregnated them with the milt, and these produced young fish."

The trials I have made have afforded similar negative results. I shall mention three in particular.

On the 10th of last November, from a stream in which there were known to be male fish with mature milt, two female trouts were taken with fully formed ova—ova that were expelled by the application of gentle pressure to the abdomen. These were placed on gravel in a glass vessel with water, which was changed twice daily; they exhibited no marks of development, and one after another became opaque from imbibing water.

On the 25th of the same month, I procured two charr from Windermere,—a male and female fish, taken from a shoal in the lake, a breeding bed. On gentle pressure to the abdomen, ova in large quantity were obtained, and abundance of spermatic fluid; each fish at the time was alive. A portion of the ova was placed in three glass vessels with gravel and water, without having been allowed to come in contact with the milt. Another portion of them was mixed with the milt, and similarly distributed. The vessels were kept in a room of pretty equable temperature, which ranged from about 51° Fahr. to 41°. that is, from the commencement to the present time, and the water—spring water—was changed daily once, and no oftener. Now, January 4th, a large number of the eggs which had been mixed with the milt are well advanced, the fœtal fish being visible in the ova with the naked eye, and this in each of the three vessels; but, on the contrary, in the other three vessels, not one egg bears any marks of vital progress; many of them have become opaque; the majority of them, and those which remain transparent, are of uniform appearance, whether seen with the naked eye or under the microscope. Under a one inch object-glass, in all of them, at one spot, a patch, as it were of cellular tissue, is observable, seemingly adhering to the membrane of the egg, with oil globules entangled in and surrounding it.

On the 2nd December, I procured some eggs from two charr, taken at the same time as the preceding, and from the same breeding shoal, and kept in company with a male fish in a well fed by a small stream. The eggs, obtained by pressure to the abdomen, were the few remaining, the greater portion having been previously shed, as was manifest from the lankness of the fish. From this circumstance, they seemed peculiarly favourable for the trial, on the hypothesis of the possible admission of the spermatic fluid *ab externo*. But the result was equally negative with the foregoing. The ova put into water, the same as that used with the impregnated, fertile ova, and under the same circumstances, all underwent no change, excepting that denoting loss of vitality.

Many other instances of the like kind I could relate, that have been communicated by friends interested in the subject; but I hardly think them necessary, those I have given appearing to me so conclusive, even on the doctrine of chances.

Next, it may be well to advert to the structure of the male and female of the Salmonidæ, to which I have alluded, as seeming to render impregnation from without very improbable.

The female, as it is well known, has no true oviduct as in the instance of the cartilaginous fish. Her ovaries are not connected with any permanent openings; an aperture for their escape being made only just before the exclusion of the ova—that is, when the ova are mature and detached from the ovaries, and when, by their volume, they distend and press on every part of the peritonæal sac, but necessarily with most effect where there is least resistance, viz., close to the anus, the very spot where the aperture is to be formed with a suitable structure for their exit. How ill adapted is this for the required effect, according to the supposition of impregnation of the ova before exclusion? Moreover, as regards the male fish, we see the same inaptitude exhibited in the conformation of its generative organs. They are of the simplest kind, the testes terminating in an aperture close to the anal end of the intestine, without even a distinct papilla furnished with erectile tissue, and open only whilst needed for the outpouring of the abundant spermatic fluid, distending the organs in which it is secreted, and by them distending the abdomen.

The inaptitude of the organs in both sexes for the presumed office is the more manifest, as it has seemed to me, the closer the attention is given to the minute structure of the

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parts concerned. In the instance of the female, the aperture is in a vascular papilla, prominent at the verge of the anus, and internally provided with folds—a somewhat valvular structure, that reminds one of the mouth of the common gall duct in man—allowing a free passage to a probe downwards, but not in the opposite direction, and being amply provided with mucous follicles, forming a provisional mucous duct, the better adapted to the descent of the ova.* In the male, the testes terminate in a common duct, slightly prominent within the verge of the anus,—the projection so small as hardly to deserve the name even of papilla, very much smaller than that of the female, and neither vascular, so far as I could ascertain, except in the ordinary manner, nor provided with any follicles, such as usually belong to the part destined for the purpose supposed.

Further, if attention be given to the manner in which the male and female fish behave during the spawning time, I think we shall have confirmation that there is no act of intromission,—which, indeed, anatomically considered, it may be presumed there cannot be,—but also that there is no attempt made favouring the notion that the spermatic fluid is injected (as would be necessary for the impregnation of the ova) into the cavity of the abdomen of the female. That the fish in the act of spawning sometimes come in contact, pressing against each other, and thereby aiding the expulsion of the ova and milt, cannot, I think, be doubted. By many observant fishermen—poachers addicted to the taking of the fish at the time of their spawning—I have been assured of the fact from their own observations; but this is very different from the act of copulation as performed in other classes of animals in which impregnation is effected before the expulsion of the ova; but though so dissimilar, perfectly suitable to the end required, and quite in accordance, as we have proof in the artificial process, with the necessary requirements.

It is an axiom that nature does nothing in vain; it is not less true that nature is perfect in her works, as regards the adaptation of means to ends. In no part of the animal economy is this more strongly and happily illustrated than in the generative system of organs, diversiform and varied as they are in the several classes of animals. Consistently, then, were the mode of impregnation that which has been asserted, we may be sure that an organization,—an apparatus would have been provided suitable to it. Also, as I think consistently with the hypothesis, we might expect occasionally to find ova in the cavity of the abdomen, bearing marks, if they had been impregnated there, of incipient development, according to the analogy of extra uterine fœtal growth sometimes witnessed in the mammalia; but none have been described, that I am aware of, as ever observed. In spent fish, that is, those which have spawned, in the instance both of the salmon and trout, I have in spring found mature transparent ova detached from their ovaries, so included, when the aperture for the passage of the ova was closed, or almost so; but they were totally destitute of any appearance of vital development.

In conclusion, granting the observations referred to—of the hatching of the ova of the trout in the manner described, viz., without milt, so far as was known, being brought into contact with the expressed ova—to be accurate in their detail, it may be asked, does the result, as stated, warrant the inference that impregnation was effected before the expulsion of the ova? The box, we are informed, containing them was placed in a stream. What is more likely than that they might have been impregnated, so included but not insulated, by the spermatic granules, the spermatozoa of milt shed by some fish in the adjoining water? The diffusibility of these living granules—not the least remarkable of their qualities—seems to be favourable to this conclusion.

Lesketh How, Ambleside, January 4, 1854.

EXTRACT of LETTER from ANDREW BUIST, Esq. Dated Perth, 10th January, 1854.

We have much to learn yet as to the natural history and habits of the salmon. I hail with pleasure every thing that is likely to add to our knowledge, and the mode of artificial rearing of salmon has my most hearty approval and co-operation; and I know well my brother participates in these sentiments, and every thing in our power will not be wanting to strengthen the hands of the Commissioners of Fisheries in Ireland, whose labours for the benefit and improvement of the country is beyond all praise; and if our experience or advice can be of any use, command our services at all times.

EXTRACT of LETTER from MICHAEL DOBBYN, Esq. Dated Waterford, 25th Feb., 1854.

Preservation is now telling here in a wonderful way, and there is now every appearance of having a first-rate year. I have, up to this, killed sixty-four salmon, only two of which were bad; they weighed 984 lbs., and produced £49 8*s.* 7*d.* I seldom killed more than twenty in the month of February before. The Passage fishermen have also killed a good many. It would, in my opinion, be injurious to make any change in the present close season, which at present appears to answer so well.

EXTRACT of LETTER from SAMSON W. FRENCH, Esq. Dated Cuskinny, 25th Feb., 1854.

You will perceive that the run of fish is much greater than for the last two years. This may be partly attributed to the effect of the protection to the spawning fish; it is also a strong proof that bag-nets have not such a pernicious effect as some persons suppose.

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* The closure of this aperture, after the exclusion of the ova, from such observations as I have made, appears to take place slowly, requiring many weeks for its accomplishment, and when effected, by so delicate a medium as to be easily ruptured. To be properly examined, the fish should, after being opened, be placed under water, and the blow-pipe be used before the probe.

EXTRACT of LETTER from JOHN LITTLE, Esq. Dated Ballina, 14th April, 1854.

I have got six rills, of about seventy-five yards long by eighteen inches wide, each with a fall of about three feet on the whole length. These are supplied with water drawn by a rose from the river, Bunru (one of the tributaries of the Moy), a distance of about four hundred yards, to a dam water, then passing through a wire lattice to the rills, at the foot of which I have the pond formed for the reception of the young fish. It being about the 17th of December when I got these finished, and the first run of salmon being nearly all spawned, I was only able to get one male and female on the 20th of same month, from which I ejected the ova and milt, in same manner they do at Galway. I deposited same on that day in the upper part of my No. 6 rill. From that time we had no floods to draw spawning fish from the main river, until the 9th of January, when I secured three female and two male salmon, the ova from which I deposited in the lower part of the same No. 6 rill. On the 17th of same month I got eight female and only three males, the produce from which I put in No. 5 rill. I could not, afterwards, secure any male salmon, though, singular to say, there was no scarcity of females. One thing struck me as remarkable—that not one of the male salmon I got was wholly ripe for spawning, part only of their milt being so.

I consider that there was deposited on the different dates as stated, viz.:—

On the 16th December, 1853, say . . .	2,500 ova
„ 9th January, 1854, „ . . .	7,500 „
„ 17th „ „ „ . . .	20,000 „
Or, in all, about	30,000 ova,

from which I anticipate from present appearances that there will be about 18,000 young fish. The fish from ova first deposited came to life on or about the 14th of March; part of the remainder on the 31st of same month. There are still, however, a good many to come to life.

EXTRACT of LETTER from Mr. WILLIAM DOHERTY. Dated Bushmills, 14th April, 1854.

On the 1st December I made the first deposit of the ova of one pair of salmon; on the 15th I made the second deposit of one pair of salmon; on the 26th I made the third deposit. Those ova deposited on the 1st December were out in the boxes, in life, on 22nd March, having taken 113 days; those deposited on the 15th, made their appearance in 110 days; and those deposited on the 26th took 101 days. The young fry are now in thousands in the boxes, and some in the pond. I think there has been about one blank ova to every ten. I think I now have about 1,100 young salmon progressing fast.

EXTRACT of LETTER from ROBERT BUIST, Esq. Dated Perth, 17th April, 1854.

Ireland and its teeming sources of valuable wealth has been too much neglected of late; yours, and the other Boards, I doubt not, will bring to light things that have been hidden in barbarism. Such scientific discoveries, carried to completion, will be, indeed, justice to Ireland

EXTRACT of LETTER from NELSON FOLEY, Esq. Dated Lismore, 1st March, 1854.

I have much pleasure in telling you that our salmon season has opened most favourably. The first day, in the course of two hours, we took twenty-five fine spring fish, on the average 11 lbs. each—some 14 lbs. and 15 lbs.—all in splendid condition. The take of salmon on the entire river, from this to the sea, has not been so good for the last twenty years. I am sorry to have to add that quantities of the spents have been killed in the stake-weirs, on their return to the sea. I have this from good authority, but it is hard to detect the offenders. We have only about 300,000 pea set in our breeding boxes; we did not like to disturb the fish on other beds in the glens in our neighbourhood. As we put some of our own men in care while the fish were on them, we thought, when we commenced fishing, we would have no difficulty in getting them; but, strange to say, although we can get some pea fish, cock fish are very strange. We have sent some impregnated spawn to Mr. Halliday, to Galway. This will test the keeping properties of spawn. The Lismore Board of Conservators paid the cost of sending a man to Galway, to learn the art of salmon breeding; they also pay a man to watch the boxes.

I hope we will have the thing in good training by next season.

EXTRACT of LETTER from NELSON FOLEY, Esq. Dated Lismore, 18th April, 1854.

We laid down about 20,000 pea at different periods from the 4th to the 20th of February. The delay in doing so was occasioned by our being unwilling to disturb the breeding salmon on the scours. Probably our attention was more directed to them this season than ever; and when we saw them thereon we used double care in protecting them; and I am happy to say, I think only one breeding salmon was killed this season on Owinia strand We thought we should have had no difficulty in procuring breeding fish on our commencing to fish on February 1st, but, strange to say, very few pea fish were taken, the melt being in the proportion of ten to one. Out of the 20,000 pea laid down, I hope we will rear 5,000 or 6,000. The young are strong, and promise well. In the selection of breeding ground we were not very fortunate, as the place abounds with frogs, beetles, and fresh-water shrimps (so I call them). These got into our breeding boxes, owing to the wires not having been put at the ends before the water was let in. So satisfied are we with what we see of the plan, that we intend, next season, to carry it out on a large scale at Glenmore, a particularly suitable place.

I am happy to add, as to fry in the natural state, I never saw such "millions." There has not been any thing like it for more than thirty years, and I never saw them so large in the fresh water as they are now. I am sorry to be compelled to say I have good reason to know that vast quantities of the slats have been killed on cross-lines, and by gentlemen who set up to be sportsmen. I know the fact, but could get no legal proof of it to prosecute.

The season, as to spring fish, has been *very* good. You know there must have been a great slack in the river, in consequence of the want of rain. The fishing in the tidal portion, strange to say, the box or cruive we call sluice hatch, that next Ballyin pleasure-ground, has been most productive. The salmon face it in the low water.

Now, as to the fly and bag nets, I wish we had not one on the coast. In those we have on the strand outside Youghal we have taken, up to Saturday, £87 worth of salmon, at a cost of £69, although having much of the gear on hand from last and other seasons. To this £69 add licence duty. Such is the state of affairs. I would never have used such vile engines, but another would have laid claim to the shore, and, in fact, did erect a fly-net, and does at present lay claim to the right of using such engines there.

EXTRACT of LETTER from GEORGE FRENNEL, Esq. Dated Clonmel, 3rd May, 1854.

The number of old fish detained immediately above the town, and of fry, most of which have now got off, every one says, has been vastly greater than for very many years—both showing the good effects of even imperfect winter preservation. I dare say you may have already heard that the take in the tideways has been very good.

In addition to the young salmon referred to at the Exhibition, the model of ladders for effecting the passage of fish over weirs attracted great attention. Mr Mulvany having directed the models to be furnished of some of the ladders designed for this object, and in successful operation upon the drainage and navigation works, procured a supply of water from the Directors of the Exhibition, and contrived that it should flow constantly through them to illustrate their use; and to aid this and make it more perfect, the Inspecting Commissioners procured small fish, which, when placed below the weir, immediately ascended in a manner which not only amused and astonished the very many who continued to witness it during the continuance of the Exhibition, but attracted the marked attention of practical and scientific men, many of whom applied for, and obtained the lithographed plans and sections prepared by Mr. Forsyth, the Board's Engineer, which were supplied for circulation by the Board's directions. The Inspecting Commissioners feel it due to Mr. Brady, the Clerk of the Fishery Office, specially, to notice the zeal he displayed in aiding them in the care and arrangement of this interesting exhibition, and much of its success is attributable to his judicious management.

General Remarks.

It is highly gratifying to be able to state, as we have done, that a decided improvement has taken place in the salmon fisheries; their importance to the country is better appreciated than heretofore; there is an advance in knowledge connected with them; that good results to a considerable extent have followed from recent legislation is generally felt and acknowledged; the principle of the present laws applying to the salmon fisheries of Ireland is generally approved, not only by those connected with this country, but persons connected with England and Wales have become sensible of their value by the increased intercommunication between the different countries, affording opportunities of gaining information. The salmon rivers of England and Wales, though limited in extent comparatively with Ireland, are not unimportant: they are similar in one respect, namely, their public nature as to the right of fishing. They are principally, like the rivers of Ireland, public rivers, and unlike the Scotch salmon fisheries, which are principally private. The former are now nearly valueless, because there are not laws in force suitable to their circumstances. We have had much communication recently with parties anxious to redeem the rivers of South Devon, the Dee, the Severn, &c., from the state of decay into which they have fallen, with the view of obtaining legislative powers, based upon the principle of the Irish Fishery Laws, by which the public may be enabled, through a legitimate and proper medium of government control, to effect an important public benefit, and by which means alone, mixed and conflicting interests can be regulated. The salmon fisheries of Ireland were fast progessing to this state when the legislature interposed, the progress of destruction has been materially arrested, and encouragement is afforded that by perseverance, and increased attention, a great national resource may, by proper and efficient government, be more fully developed; and it is very satisfactory to find that so much has already been effected as to attract the notice of our neighbours, some of whom are now anxious to follow our example.

Appendix.

Report of Inspecting Commissioners of Fisheries for 1853.

The Inspecting Commissioners conclude by stating, that some matters which they deem of great importance have engaged their consideration, and for the accomplishment of which means do not at present exist, and they hope soon to be able to offer some definite suggestions thereon, after they have been afforded an opportunity of conferring with parties interested, and ascertaining their views. One of these is providing means for the general construction of fish-passes over all weirs which are impediments to the ascent of fish to the upper waters; for though some progress has been made in this respect, the funds for this purpose at the disposal of Boards of Conservators are so limited that much time must elapse before so important an object can be generally effected. Another is the profitless state of many small rivers throughout the country, which are now of little, if any value, but may be made very valuable if the interests were not so divided. It has occurred to the Inspecting Commissioners that much good might be effected by enabling the many interested to dispose of such fisheries, receiving in proportion according to the extent of their several properties the value which might be obtained from individual purchasers or tenants, for annual rents. This, however, requires serious consideration before any plan can be matured which may be safely submitted for the consideration of the Legislature.

J. Redmond Barry.
William J. Frennell.

Office of Public Works, Fishery Department,
March 31, 1854.

Quantity of fish conveyed by the Great Southern and Western Railway for the year ending 31st December, 1853.

	Tons.	Cwts.	Qrs.
Salmon,	275	0	0
Herrings,	243	0	0
Other fish,	66	0	0
Total,	584	0	0

Midland Great Western Railway.—Return of the quantity of fish conveyed to Dublin for the year ending 31st December, 1853.

	Tons.	Cwts	Qrs.
Salmon and turbot,	77	1	0
Lobsters,	101	12	1
Cod, hake, eels, haddock, soles, &c.,	255	2	2
Oysters,	240	9	2
Total,	674	5	1

Rates of Carriage of Fish.

Dublin to London, per London and North Western Railway:—

Fresh fish,	100*s.* per ton.
Salt fish, dried or in casks,	40*s.* ,,

Great Southern and Western Railway, to Dublin:—

Salmon,	60*s* per ton.
Flat fish, eels, and dorcys,	50*s.* ,,
Shell fish,	30*s.* ,,
All other fish,	20*s* ,,

Midland Great Western Railway, to Dublin:—

Salmon and turbot, over 5 cwt, at	2*s.* 6*d.*—under 5 cwt,	3*s* 6*d.*
Lobsters, ,,	2*s* 6*d.* ,,	3*s.* 6*d.*
Cod, hake, eels, haddock, soles, &c., ,,	1*s.* 0*d.* ,,	1*s* 6*d.*
Oysters, at the rate of	20*s* per ton	

Chester and Holyhead Railway:—

Rates of carriage of fish from Dublin, *via* Holyhead, are as follows;—

To London, salmon in boxes,	5*s.* 0*d* per cwt.
Birmingham, ,,	3*s.* 6*d.* ,,
Manchester, ,,	3*s.* 0*d.* ,,
Liverpool, ,,	3*s.* 6*d.* ,,

Local stations. according to distance, from 2*s.* 6*d.* to 3*s.* 6*d.* per cwt.

APPLICATIONS received by COMMISSIONERS.

District or Place to be affected by Application.	Nature of Application.	Observations.
Londonderry District,	To have pollen net licences reduced,	Granted.
Ditto,	To have licence duty on bag nets increased,	Ditto.
Ditto,	To have pass over weir on River Roe made,	Under consideration.
Lismore District,	To have inspection of Fermoy weir made for fish pass,	Done.
Bantry District,	Change of season,	Not granted.
Sligo District,	Ditto,	Ditto.
Wexford District,	Ditto,	Granted.
Killarney District,	Ditto,	Not granted.
Letterkenny District,	Ditto,	Ditto.
Dublin District,	Ditto,	Ditto.
Waterford District,	Ditto,	Ditto.
Wexford District,	To prohibit net fishing in Slaney during close season,	Granted.
Belfast Lough,	To prohibit trawling in Belfast Lough,	Under consideration.
Kenmare District,	Change of season,	Not granted.
Kilkeel,	To make bye-laws for regulating conduct of herring fishermen,	Not in power of Commissrs.
Ballinahinch,	To have width of bars in cribs of Ballinahinch fishery reduced,	Not granted.

BYE-LAWS, ORDERS, &c., made by COMMISSIONERS.

District or Place to be affected by Bye-Law.	Nature of Bye-Law, Order.	Date.
Londonderry District,	Licence on pollen nets reduced to 10s.,	13th April, 1853.
Ditto,	Size of meshes of draft nets for taking pollen in Lough Neagh increased to $1\frac{3}{4}$ inches from knot to knot,	Ditto.
Ditto,	Licence duties on bag nets raised to maximum, £5,	2nd November, 1853.
Letterkenny District,	Change of season,	14th December, 1853.
Cork District,	Raising licence duty on bag nets and boxes or craives,	Ditto.
Galway Bay,	Regulating trawling,	9th January, 1854.
Wexford District,	Prohibiting net fishing in River Slaney during salmon close season,	25th March, 1854.
Ditto,	Alteration of season,	14th December, 1853.

LICENCES to form or plant OYSTER BEDS.

Licence granted to	Place.	Date.
J. O. Woodhouse,	In Mulroy Bay, County Donegal,	22nd September, 1853.

APPLICATIONS to form OYSTER BEDS.

Name.	Place.	Observations.
B. Bindon,	Carlingford Lough.	

MOUTHS of RIVERS defined.

Names of Rivers.	Date of Order defining Mouth of River.
Bray,	7th September, 1853.
Erne,	1st February, 1854.
Annagassen,	Ditto.

APPLICATIONS to define MOUTHS of RIVERS.

Rivers.	Decision.
Roe,	Under consideration.
Four-mile-Water,	Ditto.
Sneem,	Ditto.
Annagassen,	Defined.
Bray,	Ditto.

STATE of the REGISTRY of FISHING VESSELS on the COAST of IRELAND to 1st January, 1854, pursuant to the

NAME OF DISTRICT	BOUNDARIES.	Registering Officer.	1st Class employed in 1853.			2nd Class employed in 1853.			1st Class employed in 1854.			2nd Class employed in 1854.		
			Vessels	Men	Boys	Vessels	Men	Boys	Vessels	Men	Boys	Vessels	Men	Boys
Dublin, .	From whip of water to Breaches, Co. Wicklow.	J. J. Palmer, .	40	144	41	115	543	41	49	156	45	147	436	29
Gorey, .	From the Breaches, Co Wicklow, to the Sluice.	J. Bowie, . .	196	1,255	107	92	368	57	211	1,315	114	96	380	63
Wexford, .	From the Sluice to Fethard.	R. A. Stewart, .	36	120	4	253	1,316	6	36	120	4	265	1,371	6
Waterford, .	From Barrow Bar to Ballyvoile Head.	W. Mansfield, .	66	250	26	335	1,342	38	46	166	20	252	894	48
Youghal, .	From Ballyvoile Head to Ballywilliam Cove.	C. Bagshot, . .	68	476	45	334	1,412	129	65	391	60	318	1,412	125
Cove, . .	From Ballywilliam Cove to Flat Head.	O. P. Knott, .	112	330	37	709	2,270	197	48	107	8	281	1,252	41
Kinsale, .	From Flat Head to Inchy Bridge.	J. A. St. Leger, .	86	600	70	774	4,340	50	87	532	60	497	2,982	30
Skibbereen, .	From Inchy Bridge to Three Castle Head.	J. H. Norcock, .	40	280	25	700	3,000	280	40	280	25	700	3,000	280
Whitehorse,	From Three Castle Head to Whitehorse Head.	W. Townsend, .	27	50	10	13	16	5	2	10	4	49	100	18
Castletown, .	From Whitehorse Head to Innisherky.	T. Hungerford, .	61	218	3	1,673	7,072	126	60	215	3	1,670	7,750	120
Westcove, .	From Shirky Island to River Kena or Inny.	John Adam, .	4	20	–	90	410	50	10	30	6	150	700	11
Knightstown,	From Kena River to Castlemaine.	W. Lyons, . .	1	3	–	216	1,096	1	1	3	–	131	860	66
Dingle, .	From Inch Point to Blennerville.	William Sterne, .	20	82	5	134	680	1	15	61	4	152	737	4
Ballyhaige, .	From Blennerville to Ballybunnion.	H. Laurence, .	29	73	20	37	158	4	24	65	10	14	64	3
Kilrush, .	From Limerick to Farrahie Bay.	R. C. Michell, .	23	400	69	125	392	11	–	–	–	109	324	35

5th and 6th Vict., cap. 106, showing the Increase or Decrease in the different Districts since January, 1853.

Total employed in 1853			Total employed in 1854			Increase since 1853			Decrease since 1853			Substance of Observations made by Inspecting Commanders of Coast Guards and other Registering Officers, up to the 1st January, 1854
Vessels	Men	Boys	Vessels	Men	Boys	Vessels	Men	Boys	Vessels	Men	Boys	
191	687	82	196	592	74	5	–	–	–	95	8	No sign of improvement. General condition about the same. The take of fish less productive. The salmon fisheries less productive. No Curing Establishments exist. The habits of the fishermen are orderly; no disturbance of any kind amongst them.
288	1,623	164	307	1,695	177	19	72	13	–	–	–	Some improvement as to better class of boats, and also in nets and gear. The fishing much less productive than preceding year. Scarcely any salmon in this district, and no improvement. No Curing Establishments. No conflicts have taken place. The habits of the fishermen peaceable.
289	1,436	10	301	1,501	10	12	65	–	–	–	–	The general condition of the fishing establishment much the same. No sign of any improvement. The take of fish less productive, except as to salmon fishing, which is considerably improved, the last being the most productive for some years. No Curing Establishments exist. No conflicts. People remarkably orderly and peaceable.
401	1,592	64	298	1,060	68	–	–	4	103	532	–	A great want of good boats and gear amongst the fishermen. No sign of improvement. The take of fish not more productive. Last year's take of salmon was an improvement on the three preceding years. No Curing Establishments. No conflicts amongst the fishermen, their habits being orderly and peaceable.
402	1,888	174	383	1,803	185	–	–	11	19	85	–	The general condition of the fishery establishment is on the decline, both in boats and gear. No sign of improvement. The take of fish about an average, except in herrings and sprats, which has been much less than an average. The salmon fishing much improved. There are no Curing Establishments. The habits of the fishermen orderly and peaceable. No conflicts.
821	2,300	234	329	1,119	49	–	–	–	492	1,181	185	A very considerable decrease in the number of boats, men, and boys, and the boats and gear are in a very bad state. No sign of improvement. The take of fish less productive. No improvement in the salmon fisheries. No Curing Establishments. No conflicts have taken place. The habits of the fishermen quiet and peaceable.
860	5,140	120	584	3,534	90	–	–	–	276	1,606	30	Within the last three years there has been some improvement, and at present a better spirit exists than has appeared for some years past. The take of fish last year was not more productive than former years. Salmon fishing not improved, rather on the decline. Three Curing Establishments in existence. No new Curing Establishment has been formed. No conflicts. The habits of the fishermen orderly and peaceable.
740	3,280	305	740	3,280	305	–	–	–	–	–	–	First class boats are slightly improved in equipment and condition. Second class boats much the same. The take of fish last year was not so productive as preceding year. No improvement in salmon fishing. No Curing Establishments in existence. No conflicts whatever, the habits of the fishermen being very orderly and peaceable.
40	66	16	51	170	22	11	104	6	–	–	–	The condition of the fishing establishment in this district very bad. No sign of improvement whatever. The take of fish has been less productive. No salmon taken in this part of the district the last year. No Curing Establishment. No conflicts.
1,734	7,080	129	1,730	7,065	123	–	–	–	4	15	6	The fishing establishment not in such good condition. There appears to be no sign of improvement. No marked difference in the take of fish. The salmon fisheries in this district are very limited. No Curing Establishments at present in existence. No conflicts. The fishermen both orderly and peaceable.
94	430	50	169	730	17	75	300	–	–	–	33	The condition of the fishing establishment inferior. No sign of improvement. The take of fish rather less productive. Salmon fisheries not improved. No Curing Establishments. No conflicts. The habits of the fishermen peaceable.
217	1,099	1	132	863	66	–	–	65	85	236	–	No established deep sea fishery in this district. Boats are in bad repair and nets almost worn out. The take of fish less. Salmon fishery improved last season up the rivers, but the take by weirs and nets on the tidal waters has fallen off. Two Curing Establishments at Killerglin. Fishermen orderly and peaceable. If mackerel and herring nets were introduced the fishermen would derive much benefit from them.
154	762	6	167	798	8	13	36	2	–	–	–	There is an evident improvement in the condition of the Fishing Establishment. The take of fish less productive. No new Curing Establishment formed. There exists at present the Royal Irish Fishery Establishment for Curing fish, the only one in this district. No complaint of conflicts this year. The fishermen orderly and peaceable.
66	231	24	38	129	13	–	–	–	28	102	11	No sign of improvement in the Fishing Establishment. The take of fish less productive, no boats being employed fishing. The take of salmon was greater in 1853 than for many years previous. No Curing Establishment. No conflicts have ever occurred, the fishermen being orderly and peaceable.
148	792	80	109	324	35	–	–	–	39	468	45	On the decrease. The fish within the last ten years, have not visited the coast so much, and greater part of fishermen have emigrated. The take of fish less. Salmon fishing on the decrease. No Curing Establishment. No conflicts. The habits of the fishermen orderly and peaceable.

STATE of the REGISTRY of FISHING VESSELS on the COAST of IRELAND to 1st January, 1854, pursuant to the

NAME OF DISTRICT.	BOUNDARIES.	Registering Officer.	1st Class employed in 1853			2nd Class employed in 1853			1st Class employed in 1854			2nd Class employed in 1854.		
			Vessels.	Men.	Boys	Vessels	Men.	Boys.	Vessels.	Men.	Boys.	Vessels	Men	Boys
Seafield, .	From Farahie Beach to Black Head.	E. J. Morris, .	–	–	–	69	177	8	–	–	–	59	159	4
Galway, .	From Black Head to Mason Island.	J. Richardson, .	253	1,012	157	735	2,940	183	115	475	105	487	1,200	250
Clifden, .	From Mace Head to Ruanna Point	A. C. May, . .	72	288	10	599	2,390	–	73	283	43	445	1,429	5
Westport, .	From Ruanna Point to Achill Head	J. J. Macdonald, .	10	37	–	210	843	–	12	43	–	210	843	–
Keale, . .	From Achill Head to Duna Castle.	B. Quadling, .	6	13	–	119	1,065	–	13	43	–	235	1,020	14
Dulough, .	From Duna Castle to Brandy Point.	W. Dawson, .	–	–	–	185	677	51	–	–	–	190	628	48
Dunkeehan,	From Brandy Point to Glensky Cove.	F. Carey, . .	–	–	–	37	166	–	–	–	–	43	146	19
Ballycastle, Mayo,	From Glensky Cove to Ballina Bridge.	A. Henri, . .	–	–	–	139	983	–	–	–	–	149	1,028	9
Pullendiva, .	From Lower Bridge in Ballina to Lower Bridge in Sligo.	R. K. Thompson, .	1	3	–	89	405	3	1	3	–	93	327	–
Mullaghmore,	From Abbey Bridge, Sligo, to Abbey Point, Donegal.	J. A. Pritchard,	9	36	2	117	800	20	–	–	–	40	250	100
Killibegs, .	From Abbey Point, Donegal, to Glen Loch.	C. Blyth, . .	6	27	4	220	1,065	254	5	16	6	217	1,067	283
Lochrus, .	From Glen Lough to Gweebarra Bar.	T. Moore, . .	–	–	–	50	197	5	–	–	–	50	197	5
Rutland, .	From Gweebarra Bar to Bloody Foreland.	F. Colleris, . .	–	–	–	325	1,217	78	–	–	–	325	1,217	78
Sheephaven,	From Bloody Foreland Point to Fannet Point.	R. Head, . .	–	–	–	202	345	40	–	–	–	273	1,053	190
Rathmullen,	From Fannet Point to Ramelton, the East side of Lough Swilly.	M. Knox, . .	1	4	–	69	125	100	1	3	1	30	40	80
Carne, .	From Leenan Bay to Innishowen Head.	G. S. Penfold, .	–	–	–	83	504	56	–	–	–	96	535	22

5th and 6th Vict., cap. 106, showing the Increase or Decrease in the different Districts since January 1853.

Total employed in 1853.			Total employed in 1854.			Increase since 1853.			Decrease since 1853.			Substance of Observations made by Inspecting Commanders of Coast Guards and other Registering Officers, up to the 1st January, 1854.
Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	Vessels.	Men.	Boys.	
69	177	8	59	159	4	–	–	–	10	18	4	The condition of this Fishing Establishment greatly fallen off. No sign of improvement. The take of fish less productive. Very few salmon taken. No Curing Establishments. No conflicts. The habits of the fishermen are peaceable and orderly.
988	3,052	340	602	1,675	355	–	–	15	386	2,277	–	Improving very greatly since the Claddagh men began to trawl. The take of fish more productive. Salmon fisheries fallen off. One Curing Establishment exists. The conflicts are much less frequent. The habits of the fishermen more orderly and peaceable since the Claddagh men have been induced to trawl.
671	2,684	10	518	1,712	48	–	–	38	153	972	–	In 1844, the boats, gear, &c., were kept in good order, but at present the reverse is the case, there being no gear, and the boats unseaworthy from neglect. The take of fish less productive. Salmon fishing of the usual average. There are no Curing Establishments. No conflicts amongst the fishermen.
220	880	–	222	886	–	2	6	–	–	–	–	The condition of the Fishing Establishment very indifferent. No apparent improvement. The take of fish much less productive. The salmon fishing not improved. No Curing Establishments. No conflicts, the habits of the fishermen being orderly and peaceable.
125	1,083	–	248	1,063	14	123	–	–	–	20	–	The present state of the fishery, as compared with 1844, on the decline. No sign of improvement. The last year has been less productive than the preceding. No Curing Establishments formed, nor any attempt made to cure fish. No conflicts.
185	677	51	190	628	48	5	–	–	–	49	3	The condition of the Fishing Establishment much improved as to boats, gear, &c. The last year has been less productive on this part of the coast. Ballycroy salmon fishery considerably improved—take of salmon much greater than in former years. No Curing Establishments. No conflicts. The habits of the fishermen peaceable and orderly.
37	106	–	43	146	10	6	20	19	–	–	–	Falling off in number and efficiency. Very little sign of improvement. The take of fish about the same. Very few salmon taken. No Curing Establishment. One forming at Portacloy. No conflicts have occurred. The habits of the fishermen very orderly and peaceable.
139	983	–	149	1,028	9	10	45	9	–	–	–	The condition of the Fishing Establishment bad. Some signs of improvement. The take of fish less productive, owing to the inclemency of the weather. The salmon fishery at Ballycastle did not cover its expenses. At Kilcummin the salmon fishing was very successful. No Curing Establishments. No conflicts have taken place.
90	408	3	94	330	–	4	78	3	–	–	–	The fishing worse. No sign of improvement. Last year was rather more productive. The salmon fisheries not improved. No Curing Establishments. No conflicts. The habits of the fishermen orderly and peaceable.
126	836	22	40	250	100	–	–	78	86	586	–	The Fishing Establishment very much fallen off. The take of fish much less productive. The Sligo salmon fishery has much improved. No Curing Establishments. There has been no conflicts. The habits of the fishermen peaceable and orderly.
226	1,112	258	222	1,083	289	–	–	31	4	29	–	Considerable falling off in the Fishery Establishment. The take of fish less productive, with exception of hake and sprats. No improvement in the salmon fisheries. No Curing Establishments. No conflicts whatever. The habits of the fishermen orderly and peaceable.
50	197	5	50	197	5	–	–	–	–	–	–	The condition of the Fishery Establishment much worse. A slight improvement in mending their boats. The take of fish less productive, with the exception of salmon. Last year's salmon fishing was the best for many years. No Curing Establishments. No conflicts.
325	1,217	78	325	1,217	78	–	–	–	–	–	–	No improvement in the Fishing Establishment. The take of fish considerably less productive. Salmon fishing improved this year. No Curing Establishment. No conflicts on this line of coast for many years.
202	345	40	273	1,053	190	71	708	150	–	–	–	The condition of the Fishing Establishment appears to be on the decline. The take of fish less productive, with the exception of herrings, which was more productive, and would have been very good, but that the nets were bad. No improvement in the salmon fishing appears to have taken place. No Curing Establishment. No conflicts take place between the fishermen on this coast. The habits of the fishermen peaceable.
70	129	100	31	43	81	–	–	–	39	86	19	Much fallen off from want of means to purchase boats and gear. The take of fish not so productive. The salmon fisheries greatly fallen off. No Curing Establishments. No conflicts. The habits of the fishermen orderly and peaceable. A much larger quantity of fish could be caught if the fishermen were better supplied with boats and gear, as bait can be obtained plentifully.
88	504	56	96	535	22	8	31	–	–	–	34	A great falling off in the number of boats, and in the state of their gear owing to the extreme poverty of the fishermen. The last year has been less productive than usual. The salmon fishery has fallen off considerably. No Curing Establishment whatever. No conflicts have occurred. The habits of the fishermen peaceable and orderly.

State of the Registry of Fishing Vessels on the Coast of Ireland to 1st January, 1854, pursuant to the

Name of District	Boundaries.	Registering Officer.	1st Class employed in 1853			2nd Class employed in 1853			1st Class employed in 1854			2nd Class employed in 1854		
			Vessels	Men.	Boys	Vessels	Men	Boys.	Vessels.	Men	Boys.	Vessels	Men	Boys.
Greencastle,	From Innishowen Head to Down Hill	H. R. Raye, .	19	43	–	162	653	28	8	24	–	134	560	19
Ballycastle, .	From Magilligan Point to Mountain Stream, South of Drumnasloe	J. A. Abbott, .	–	–	–	236	566	44	2	9	–	235	500	40
Carrickfergus,	From Drumnasloe to Bars Port	A. Little .	21	55	6	193	344	72	10	32	5	197	553	67
Donaghadee,	From Bars Port to Ballyquinton	R. Studdert, .	107	482	16	561	1,146	194	111	502	19	601	1,256	201
Strangford, .	From Ballyquinton to Sheepland Head.	E. G. Elliott,	8	68	10	450	1,482	54	8	68	10	455	1,400	50
Newcastle, .	From Gunn's Island to River Foott.	C. J. Austin,	2	13	1	96	375	69	3	16	–	101	306	40
Carlingford, .	From River Foott to Ballagan Point, including Carlingford Lough.	C. Servante, .	9	52	1	235	1,164	7	9	38	–	287	903	7
Dundalk, .	From Ballagan Point to Maiden Tower.	W. J. Lake, .	2	12	–	116	452	94	3	16	2	116	460	88
Malahide, .	From Maiden Tower to Whip of Water.	J. Irwin, .	52	333	51	59	218	7	53	325	46	60	227	6

Queries Relative to Refuse Fish.

To the Inspecting Commander or Inspecting Chief Officer of Coast Guards.

District of ________________

The question of converting refuse fish, and the offal from cured fish, or the garbage of what may be consumed fresh, into artificial manure, having attracted much public attention, and numerous applications having been made to the Commissioners in reference to the probable quantity that could be procured at an encouraging price, the Board will feel much obliged if you could obtain, through your local officers, such information as may aid them in forming some estimate of the quantity of this material which the inducement of a steady demand and a liberal price would be likely to produce. With this view, your attention is called to the following queries:—

5th and 6th Vict., cap. 106, showing the Increase or Decrease in the different Districts since January 1853.

Total employed in 1853.			Total employed in 1854.			Increase since 1853.			Decrease since 1853.			Substance of Observations made by Inspecting Commanders of Coast-Guards and other Registering Officers, up to the 1st January, 1853.
Vessels.	Men	Boys.	Vessels.	Men	Boys.	Vessels.	Men.	Boys.	Vessels	Men.	Boys	
181	696	28	142	584	19	–	–	–	39	112	9	The general condition much on the decline, except at Moville for the cod and herring fishery, and the salmon fishery near Culmore. The take of fish more productive as regards salmon and herrings, but less so with respect to other fish. Trawling not productive, owing to the roughness of the season. Salmon fishery much improved. No Curing Establishment. No conflicts.
236	566	44	237	500	40	1	–	–	–	57	4	No improvement in the condition of the Fishery Establishment. The take of fish much the same as preceding year. The salmon fisheries not improved. A Curing Establishment formed at Port Ballintrae has been given up. No Curing Establishment at present exists. No conflicts. The fishermen are all peaceable.
214	599	78	207	585	72	–	–	–	7	14	6	There does not appear to be any change or improvement in the boats, their gear, lines, or nets. The last year has been more productive than the preceding year. The salmon fishery has not improved. There are no Curing Establishments nor any attempt made to cure the fish. There have been no conflicts of any kind.
668	1,168	210	702	1,758	220	34	590	10	–	–	–	There are many boats on the coast which fish occasionally with old-fashioned gear. No improvement. The take of fish somewhat less productive. No improvement in the salmon fishing. No Curing Establishments. No conflicts. The habits of the fishermen peaceable.
458	1,500	64	463	1,468	60	5	–	–	–	32	4	No improvement in the condition of the Fishing Establishment. The take of fish rather less productive. No salmon fisheries within the district. No Curing Establishments. No conflicts. The habits of the fishermen orderly and peaceable.
98	408	70	104	322	40	6	–	–	–	86	50	The condition of the Fishing Establishment worse than in 1854, except Newcastle station. The take of fish less productive. The salmon fisheries not improved. No Curing Establishments have been formed. The conflicts have been less frequent this year. The habits of the fishermen more peaceable than usual.
244	1,214	8	296	1,001	7	52	–	–	–	213	1	The Fishing Establishment very indifferent. No sign of improvement. The take of fish less productive. No salmon fishery. No fish cured. No Curing Establishments formed. No conflicts. The habits of the fishermen orderly and peaceable.
115	461	94	110	476	90	4	12	–	–	–	4	The Fishing Establishment in fair condition. The take of fish less productive. The salmon fisheries have not improved. No Curing Establishments, or any attempt made to cure fish. No Conflicts. The habits of the fishermen orderly and peaceable.
111	551	61	113	552	52	2	1	–	–	–	9	The first class vessels at Skerries and Howth improved, but retrograded at Balbriggan. Little or no improvement. The take of fish much similar to last year. No salmon fisheries. No Curing Establishments. The fishermen are orderly and peaceable, and there are no conflicts.

1st. How have the fishermen been in the habit of disposing of the dog-fish, skate, and other coarse fish, taken either on lines or in nets, and is the quantity considerable relatively with the edible fish, and what price is obtained for the portion sold?

2nd. What quantity of offal, consisting of heads, vertebræ, and garbage, do the several curing establishments in your district produce, and how, and at what price, have they been in the habit of disposing of it?

3rd. Is there any considerable quantity of garbage thrown along the shores and strands by the fishermen and their wives, and would they be induced by a fair price to preserve it?

4th. Has the quantity of herrings or sprats in any of the stations of your district ever so far exceeded the demand for local consumption, or for curing, as to leave any considerable quantity for manure, and at what rate has it in such cases been sold?

SUBSTANCE of REPLIES received from Inspecting Chief Officers of Coast Guards, with or the Garbage of what might be

DISTRICT.	First—How have the Fishermen been in the habit of disposing of the Dog-fish, Skate, and other coarse Fish, taken either on Lines or in Nets, and is the quantity considerable relatively with the edible Fish, and what price is obtained for the portion sold?	Second—What quantity of Offal, consisting of Heads, Vertibræ, and Garbage, do the several Curing Establishments in your District produce, and how and at what price have they been in the habit of disposing of it?
1.—Dublin, . .	No information to offer.	No information to offer.
2.—Gorey, .	There are no fish cured in this district. Scarcely any Fisheries in this district except oysters and herrings.	Nil.
3.—Wexford, . .	A considerable portion of the fish captured on this coast is taken to the inland counties of Carlow and Kilkenny, and the quantity of offal is very inconsiderable.	No curing establishments in this district.
4.—Waterford, .	Dog fish consumed by the poorer classes. The quantity caught not considerable.	No curing establishments.
5.—Youghal, . .	The best of the dog fish are salted, and sold for about 10*d.* per score. Skate sold fresh for about 1*s.* 3*d.* per score. The refuse thrown into the tide, quantity considerable, relative to the edible fish.	Heads of cod, ling, and hake salted and sold for a mere trifle. No curing establishments, and no garbage sold.
6.—Cove, . .	They are used for food by the poorer classes.	No curing establishments within this district.
7.—Kinsale,	Dog fish, skate, and other coarse fish are taken in great quantities; but the greater portion of them are thrown back again into the sea for the want of demand. Some of them are brought to land for the aid of the fishermen's families, or sold at very reduced prices—at the rate of 2*d.* or 3*d.* each for the large skate; and large dog-fish from 1*d.* to 1½*d.* each; also congers of a very large size, when cured, sell at 3*d.* or 4*d.* each.	The quantity of offal produced at the curing establishments and along the coast, I am of opinion, is about 120 tons weekly, and, when sold, brings from 2*s.* to 2*s.* 6*d.* per car load (10 cwt.), but a much greater quantity of coarse fish would be brought to land by the fishermen if a fair price was obtainable for them.
8.—Skibbereen, .	The poor people salt and eat the dog-fish, skate, &c. The quantity taken is about one fourth of all that is taken. I am not aware that any of the coarse fish is sold.	There are no curing establishments.
9.—Whitehorse, .	Very few of those coarse kind of fish taken about here. What few taken are readily made use of, and none sold or thrown away.	What small quantity there may be is mixed with the dung heap.
10.—Castletown, .	The quantity taken is very inconsiderable; so much so, the fishermen never think of appropriating them to any purpose.	There are no curing establishments.
11.—Westcove, . .	Dog fish are generally thrown away, but very few are taken. Skate are salted. The quantity of the latter taken is also very trifling.	Farmers' houses and fishing boats are so scattered on this coast, that no accurate idea can be formed as to quantity of offal, &c.
12.—Knightstown, .	The fishermen generally eat the dog-fish and skate: at times, when they are sold, the price is from 1*d.* to 4*d.* each. The quantity is considerable—sometimes more, and often less, than the edible fish.	The heads of all fish are saved except those of hake, dog fish, and skate. The garbage, vertibræ, &c., is left scattered on the strand till it is washed away by the tide. The quantity of offal is about six carts.
13.—Dingle, . .	Dog fish are cured from 10*s.* to 12*s.* per hundred. Skate are sold from 1*d.* to 1½*d.* each fish. They are taken with hook and trawl, but not in great quantities relatively with other coarse fish.	Heads are given to the poor. The sound is stripped of the vertibræ. The livers are converted into oil, and all the remaining parts are thrown away and not preserved, except some few of the fishermen may put some into the dung pit, consequently none have been undisposed of.
14.—Ballyheige, .	Very few taken, and those consumed by the fishermen and their wives and families.	None.
15.—Kilrush, . .	They eat all they catch; the whole quantity caught is inconsiderable. 2*s.* 6*d.* to 3*s.* 6*d.* a dozen for the dog fish.	There are no curing establishments in this district.
16.—Seafield, . .	There has been but a very small supply of fish of any sort taken in the Seafield district for the last few years. Formerly the few dog-fish, skate, &c., taken were thrown away; but since the distress occasioned by the potato failure, the few taken are consumed by the very poor.	There are no curing establishments in this district. The small quantity of offal would not pay for collecting.
17.—Galway, . .	Fish not fit for market are generally thrown out of the trawl. The refuse fish could be purchased for £3 a ton.	There is but one curing establishment in Galway. They dispose of their offal, at about £1 a ton, to the person who has the manure manufactory here.

APPENDIX.

Report of Inspecting Commissioners of Fisheries for 1853.

reference to the Question of Converting Refuse Fish, and the Offal from Cured Fish, consumed fresh, into Artificial Manure.

Third—Is there any considerable quantity of Garbage thrown along the Shores and Strands by the Fishermen and their Wives, and would they be induced by a fair price to preserve it?	Fourth—Has the quantity of Herrings or Sprats in any of the Stations of your District ever so far exceeded the demand for local consumption, or for curing, as to leave any considerable quantity for manure, and at what rate has it in such cases been sold?	Inspecting Officer.
No information to offer.	No information to offer.	J. J. Palmer.
Nil.	None ever left for manure.	John Bowie.
There is some small quantity, but the greater proportion is given to the pigs.	The take of herrings and sprats have considerably decreased on this coast during the last two years, and the demand far exceeds the supply.	R. A. Stewart.
The garbage kept for feeding dogs.	Nil.	W. Mansfield.
There is considerable quantity of garbage, all thrown into the tide, which would be preserved if a fair price could be obtained for it.	There are seldom more herrings or sprats taken than are required for local consumption and curing. Such generally have been taken to Youghal, and sold at from 2*d.* to 3*d.* per firkin. A small description of sprats are often seen, but there being no market for them, are not taken.	C. Bagshott.
No.	Not to my knowledge.	O. P. Knott.
A great quantity is thrown along the shores and strands by the fishermen and their wives, which would be readily preserved were they induced to do so by a fair price.	It frequently occurs in this district that the take of sprats far exceeds the demand for consumption or curing, and are sold for manure at about 2*s.* to 2*s.* 6*d.* per ton.	Jas. A. St. Leger.
There is much less than might be supposed. I have frequently seen the very poor people cook and eat the heads of fish picked up on the strands. No doubt garbage would be collected for sale if proper places of deposit were appointed; but if every fisherman made his own deposit, it would become a nuisance, and call for magisterial interference.	In 1852 the sprats were far too numerous for consumption, and great quantities strewed the strands and floated on the sea, especially in Glandore Harbour. Much might be collected for manure, but I never heard that any person took the least interest in that way of disposing of them.	J. B. Norcock.
None whatever.	The quantity of herrings and sprats taken this year, although something more than last, is not half sufficient for the immediate consumption of the neighbouring inhabitants.	R. V. J. Grahame.
The quantity is very trifling.	When the quantity exceeds the local consumption, fishermen from remote districts purchase the herrings at from 2*s.* 6*d.* to 5*s.* per 1,000.	T. Hungerford.
They would; but the quantity is not large, nor is the garbage in any quantity.	There are hardly any herring nets in this lough; the chief nets are small nets for hake; consequently there are very few herrings taken, and generally there is a good demand for them.	J. Adam.
There is sometimes a considerable quantity. The fishermen take their fish sometimes to their homes, and leave the garbage, &c., about. They would be willing to preserve it.	No sprats taken in this district, as there are no proper nets for capturing herrings. The take never exceeds the local demand.	W. Lyone.
What garbage is left on the strands is very trifling, and not worth preserving for sale.	No sprats taken on this part of the coast, and the quantity of herrings never has exceeded the local demand since 1846.	—
Nil.	Never.	H. T. Laurence.
Nil.	There are no sprats. Herrings are sometimes caught for present consumption, but they have never been used for manure nor for curing.	R. C. Michell.
But little garbage on the shore, and not worth collecting.	But small quantities of herrings or sprats caught off this part of the coast. In no instance has any been used for manure in this district.	E. J. Morriss.
Very little; but I think the fishermen might be induced to preserve it.	Never, the fish being required for bait. The best kind of fish for making manure have been found to be muscles and scollops, of which I think a larger supply might easily be obtained, and probably will be.	J. Richardson.

APPENDIX

Report of Inspecting Commissioners of Fisheries for 1853.

SUBSTANCE of REPLIES received from Inspecting Chief Officers of Coast Guards, with or the Garbage of what might be

DISTRICT.	First—How have the Fishermen been in the habit of disposing of the Dog-fish, Skate, and other coarse Fish, taken either on Lines or in Nets, and is the quantity considerable relatively with the edible Fish, and what price is obtained for the portion sold?	Second—What quantity of Offal, consisting of Heads, Vertibræ, and Garbage, do the several Curing Establishments in your District produce, and how and at what price have they been in the habit of disposing of it?
18.—Clifden, . .	The natives are so wretchedly poor on this coast, that they eat all the fish caught, the quantity is inconsiderable.	There are no curing establishments in the Districts, neither is there any market for offal, &c
19.—Westport, . .	They are almost invariably eaten by the fishermen, and never disposed of	No curing establishments in this District by which to judge
20.—Keel, . . .	The garbage is invariably thrown into the sea	None taken
22.—Dunkeehan, .	There is very little taken, but they use it all for their farms	A good deal formerly, but now very little; it is thrown in the manure heap
23.—Ballycastle, Mayo,	What coarse fish are taken are either eaten or used for bait.	There are no curing establishments in the District.
24.—Pullendiva, . .	Very small quantities of fish taken here; all the refuse fish are made use of by the fishermen's families.	Nothing worth mentioning; when such is the case, the pigs get them
25.—Mullaghmore, .	They sell all kinds of fish they take, and there is very little skate or dog fish taken	There are no curing establishments in this District.
26.—Port Rushine, .	Quantity very inconsiderable, and thrown overboard	What little offal arises from the small quantity of fish cured by the fishermen themselves is used by them for manure, the most of them having small holdings of land.
21.—Dulough, . .	Dog fish and skate are consumed by the country people, except such as are caught by the Dublin Fishery; those are cured and taken to Dublin, and bring very good prices.	The heads are sold for the consumption of the poor people, the garbage is made into oil.
27.—Lochrus, . .	Nil	Nil.
28.—Rutland, . .	No dog fish or skate taken, or coarse fish, in any quantity available for such purpose	No curing station.
29.—Sheephaven, .	They eat skate; the few dog fish that are caught are not brought on shore.	Only one person in Dunfanaghy who cures the crue fish; he converts the offal into manure for his farm, at Doving's bay. When three or four cargoes are cured during the season, the offal is disposed of at the rate of 1s. 3d. per cargo, for the heads, &c.
30.—Rathmullen, .	The quantity inconsiderable, not sold	No curing establishments.
31.—Carne, . .	Dog fish are taken and sold here, and, with the skate, are considered edible fish. The quantity taken of late years cannot be said to be considerable, compared with other and more saleable fish. The dog-fish sells at about 1s. per dozen.	No considerable quantity of garbage is seen along shore, owing to persons cleaning fish near to or in their houses, which are sometimes distant some hundreds of yards from the shore, the garbage is thrown on the dung hills, it is never sold here
32.—Greencastle, .	Very few dog-fish or skate taken; but, if taken, then they are sold at from 1s. to 14d per dozen.	No curing establishments.
34.—Carrickfergus, .	The quantity of coarse fish taken is very inconsiderable, and mostly consumed by the fishermen's families. They use the dog-fish in baiting their creels to capture buckies for bait	There are no curing establishments in this District, and the take of fish is so inconsiderable, generally, that it is bought up immediately.
35.—Donaghadee, .	Very few coarse fish are taken here, of which most are thrown overboard, and some given to the pigs, mixed with other food, none sold.	So little it is not worth selling or keeping.
36.—Strangford, . .	No refuse fish taken in this District.	No curing establishments.
37.—Newcastle, . .	The quantity is inconsiderable, they use most for manure themselves, and sell some Skates sell from 1d. to 2d. each.	Nil, no curing establishments in this District.
38.—Carlingford, .	The fish mentioned are used by the fishermen. Dog fish 3d. a dozen.	No curing establishments; the offal is used for manure, and the livers converted into oil for their own use.
39.—Dundalk, .	All consumed by the fishermen.	No curing establishments.
40.—Malahide, .	Dog-fish, skate, and other coarse fish are salted and consumed by the inhabitants, the quantity is not considerable, except at Rush station, where it is sold to country buyers at a high price—skate from 9d. to 10d. each, according to size, and dog fish at about 1s. per dozen.	There are no curing establishments in this District.
33.—Ballycastle, . .	Dog fish, except the large ones, which are generally kept for the oil, are thrown overboard. Skate, &c., kept for their own use by fishermen; quantity small, and never sold.	No curing establishments in this District.

reference to the Question of Converting Refuse Fish, and the Offal from Cured Fish, consumed fresh, into Artificial Manure.

Third—Is there any considerable quantity of Garbage thrown along the Shores and Strands by the Fishermen and their Wives, and would they be induced by a fair price to preserve it?	Fourth—Has the quantity of Herrings or Sprats in any of the Stations of your District ever so far exceeded the demand for local consumption, or for curing, as to leave any considerable quantity for manure, and at what rate has it in such cases been sold?	Inspecting Officer.
No.	The quantity has not exceeded the demand, neither is it ever used for manure.	A. C May.
None in any quantity, as the livers are generally used to make oil	Never, to my knowledge.	J. J. Macdonald.
But a very small quantity taken, of little or no value; but that little they could easily be induced to preserve, if required to do so.	But a very small quantity None taken.	B. E. Quading.
None lately.	No. Very few herrings taken, no sprats. Herrings have been sold at from 3s. to 6s per hundred, this year, here.	F. Carey.
Nothing of consequence.	The quantity of herrings taken is never enough for the inhabitants; sprats are not caught here.	A. P. Dennis.
None whatever.	No, never exceeding the demand.	R. K Thompson.
None; the fishermen use but little for themselves, as it is generally bought up for the Enniskillen and inland markets.	There has been no surplus for manure within my knowledge.	J. A Pritchard.
None.	No considerable stock of herrings for the last ten years. Sprats have sometimes exceeded the local demand for consumption and curing, on which occasions they have met a market among the neighbouring farmers, for manure, at about 10s per ton	C. Blyth
None worth notice.	Never.	William Dawson.
Nil	Nil.	T Moore.
No garbage, quantity of fish taken very small	Neither taken of late years in any quantity to supply the demand for food.	T. Collins.
None; it would not be worth preserving.	Not for the last twenty years.	
No.	Not of late years.	M Knox.
No considerable quantity; it is added to the dung-heaps They might be induced to preserve it for sale.	There has been no occurrence of such a glut of herrings, sprats, or any other kind of fish, so as to leave any considerable quantity for manure; and in no case have I known it to be sold	G. S Rufold.
Not any considerable quantity of garbage, thrown out. The skate are mostly sold.	The quantity of herrings not equal to the local demand, and no sprats caught.	H. R. Raye.
No; they are required for baiting their buckie creels.	The herrings are generally saved in this District, compared with others, and there is no record of any excess over consumption having taken place.	A. Little
The price would not induce them to take care of it.	No sprats, very few herrings, which sell high	R. Studdert.
None.	No.	E. G. Elliott.
Very little garbage here, the fish being mostly taken away to Belfast and other towns; what there is is brought home by fishermen and wives, for pigs and dung-pit.	Nil. Never.	Charles J. Austin.
None; all made use of, and the quantity too small for sale.	A ready market on the spot for all that is caught, the cadgers carrying the herrings and other fish in town.	C Servante.
Nil.	Never.	J Sibbald.
Not considerable, except at Rush, where there is a large quantity, and many of the people would save it for manure if there was a fair price given.	The take of herrings on this coast has never exceeded the demand for consumption and curing.	J. Irwin.
No.	None are taken in the District.	T. A. Abbot.

SCHEDULE of LICENCE DUTIES received by the BOARDS of

DISTRICT.	Number and Description of Licences sold in 1852.																	1852. Total Amount received for Licence Duties in 1852.	1852 Average Number of Men employed.
	1 Salmon Rods	2 Cross Lines	3 Snap Nets	4 Draft Nets	5 Drift Nets	6 Trammel Nets	7 Pole Nets	8 Bag Nets	9 Fly Nets	10 Stake Nets	11 Head Weirs	12 Box, Crib, &c.	13 Gap, Eye, &c.	14 Sweepers	15 Coghills	16 Loop Nets	17 Trammels, £5	£ s. d.	
1 Dublin,	97	1	–	18	–	–	–	1	–	–	–	–	–	–	–	–	–	79 0 0	201
2. Wexford,	27	–	–	24	6	–	–	10	–	–	–	–	–	–	–	–	–	76 15 0	226
3 Waterford,	54	62	156	14	14	–	–	6	–	9	24	6	28	–	–	–	–	395 10 0	1,098
4 Lismore,	43	42	6	5	–	–	–	6	–	22	14	3	–	–	–	–	–	622 10 0	308
5 Cork,	95	10	–	48	–	–	–	15	–	–	–	7	–	–	–	–	–	174 10 0	483
6¹ Skibbereen,	16	–	–	6	–	–	–	–	–	–	–	–	–	–	–	–	–	17 0 0	52
6² Bantry,	6	–	–	12	–	–	–	7	–	–	–	–	–	–	–	–	–	37 0 0	103
6³ Kenmare,	22	–	–	11	–	–	–	1	–	–	–	–	–	5	–	–	–	45 0 0	122
7 Killarney,	79	11	5	51	–	–	–	1	–	4	–	1	–	–	–	–	–	173 5 0	449
8 Limerick,	146	23	28	64	–	–	8	20	11	29	1	15	214	–	–	–	–	662 0 0	1,411
9 Galway,	81	15	–	4	–	–	–	–	–	–	–	6	–	–	–	–	–	76 10 0	137
10¹ Ballynakill,	34	–	–	8	–	–	1	–	–	–	–	3	–	–	–	–	–	67 10 0	86
10² Bangor,	12	–	–	4	–	–	–	4	–	–	–	1	–	–	–	–	–	24 10 0	54
11. Ballina,	53	–	–	11	1	–	–	5	–	–	–	10	–	–	–	–	6	152 10 0	154
12 Sligo,	19	–	–	15	–	–	–	6	–	–	–	4	1	–	–	–	–	87 10 0	143
13 Ballyshannon,	50	1	–	9	–	–	–	12	–	–	–	6	–	–	21	–	–	262 0 0	187
14 Letterkenny,	11	–	–	8	–	–	–	6	–	–	–	5	–	–	1	–	–	45 10 0	94
15. Londonderry,	46	22	–	41	–	159	3	29	–	12	–	6	61	–	–	1	–	706 16 0	956
16. Ballycastle,	11	–	–	4	–	–	–	34	–	–	–	3	3	–	–	–	–	199 10 0	178
17. Drogheda,	—	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	—	—

The estimate of the average number of

Salmon Rods,	1 man.	Draft Nets,	6 men.	Pole Nets,	3 men
Cross Lines,	2 men.	Drift Nets,	5 do.	Bag Nets,	4 do.
Snap Nets,	4 do.	Trammel Nets,	2 do.	Fly Nets,	4 do.

BYE-LAWS, RULES, and REGULATIONS, approved by the LORD LIEUTENANT in Council.

We, the Commissioners acting in execution of an Act made and passed in the Fifth and Sixth Years of the reign of Her present Majesty, Queen Victoria, intituled "An Act to regulate the Irish Fisheries," and the several Acts since passed amending the same, do hereby, in pursuance of the powers by said Acts, or some or one of them, for that purpose in us vested, make the following Bye-Laws, Rules, and Regulations, to be observed by all persons employed in the *Oyster Fishery, or in Fishing for Oysters* in Cork Harbour, and the Estuaries of the Rivers flowing into same:—

First.—That between the First day of May and the First day of September in any year no Boat shall have on board any Dredge or other Implement for the taking of Oysters; and if between the periods aforesaid, there shall be on board any Boat any such Dredge or other Implement for the taking of Oysters, the Master or Owner of such Boat shall, for each such offence, forfeit and pay a sum of Two Pounds.

Second.—Every Fisherman shall, on the Fishing Ground, cull all such Oysters as he shall take or catch, and shall not remove from such Fishing Ground or Oyster Beds any Oyster of less dimensions than Two Inches and One-half, at the greatest diameter thereof, and shall at the same time throw back into the Sea all such gravel and fragments of shells as he shall raise or take while engaged in such fishing; and any person offending in any

CONSERVATORS in Ireland for the Years 1852 and 1853.

Number and Description of Licences sold in 1853																	1853. Amount of Licence Duty.	1853. Per centage on Poor Law Valuation.	1853. Total Amount received.	1853. Average Number employed	Increase or Decrease between 1852 and 1853			
1. Salmon Rods.	2. Cross Lines.	3. Snap Nets.	4. Draft Nets.	5. Drift Nets.	6. Trammel Nets.	7. Pole Nets.	8. Bag Nets.	9. Fly Nets.	10. Stake Nets.	11. Head Weirs.	12. Box, Crib, &c.	13. Gap, Eye, &c.	14. Sweepers.	15. Coghills.	16. Loop Nets.	17. TrammelNets£5.	£ s. d.	£ s. d.	£ s. d.		Increase in Amount. £ s. d.	Decrease in Amount. £ s. d.	Increase in Number employed.	Decrease in Number employed.
160	–	–	13	–	–	1	1	–	–	–	–	–	–	–	–	–	105 0 0	4 0 0	107 0 0	245	28 0 0	—	41	—
33	–	–	20	–	4	–	9	–	–	–	–	–	–	–	–	–	85 10 0	—	85 10 0	251	8 15 0	—	25	—
69	54	118	11	14	–	–	1	–	9	22	6	27	–	–	–	–	346 0 0	—	316 0 0	003	—	49 10 0	—	195
55	37	7	7	–	–	1	11	5	21	16	2	–	–	–	–	–	302 15 0	31 0 0	333 15 0	382	11 5 0	—	54	—
74	20	–	47	–	–	–	11	–	–	–	8	–	–	–	–	–	158 0 0	—	158 0 0	456	—	10 10 0	—	27
‡–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	—	—	—	—	—	—	—	—
2	–	–	12	–	–	–	7	–	–	–	–	–	–	–	–	–	36 10 0	—	36 10 0	102	—	0 10 0	—	1
33	–	–	11	–	–	–	3	–	–	–	1	–	6	–	–	–	63 10 0	—	63 10 0	149	18 10 0	—	27	—
80	9	2	48	–	–	–	1	–	3	–	4	–	–	–	–	–	157 10 0	—	157 10 0	410	—	15 15 0	—	39
163	32	22	67	–	–	5	38	24	29	–	13	227	–	–	–	–	754 0 0	—	754 0 0	1,576	92 0 0	—	165	—
55	15	–	10	–	–	–	–	–	–	–	8	6	–	–	–	–	86 10 0	—	80 10 0	152	4 0 0	—	22	—
19	–	–	9	–	–	–	–	–	1	–	3	–	–	–	–	–	38 0 0	—	38 0 0	79	0 10 0	—	—	7
12	1	–	5	–	–	–	4	–	–	–	1	–	–	–	–	–	27 10 0	—	27 10 0	61	3 0 0	—	7	—
55	–	–	12	2	–	–	5	–	–	–	10	–	–	–	12*	–	156 10 0	6 0 0	162 10 0	173	11 0 0	—	19	—
22	–	–	9	–	–	–	5	–	–	–	–	1	–	–	–	–	37 10 0	9 10 0	47 0 0	98	—	40 10 0	—	45
50	2	1	–	7	1	–	14	–	–	–	5	–	–	24	–	–	197 0 0	50 0 0	247 0 0	185	—	15 0 0	—	2
17	–	–	6	–	–	1	4	–	–	–	5	–	–	–	–	–	40 10 0	—	40 10 0	74	—	5 0 0	—	20
39	28	1	65	1	99	3	23	–	12	–	5	74	–	–	–	–	400 10 0	117 12 7	518 2 7	861	—	188 13 5	—	95
18	–	–	2	–	–	–	35	–	–	–	3	4	–	–	–	–	203 10 0	—	203 10 0	—	4 0 0	—	—	2
57	11	5	39	–	–	–	–	–	–	–	6	40	–	–	–	–	136 15 0	—	136 15 0	415	—	—	—	—

men employed is made up as follows:—

Stake Nets, . 4 men.	Gap, Eye, &c. . . 2 men.	Loop or Frame Nets, . 1 man.
Head weirs, . . 1 man.	Sweepers, . . 6 do.	Trammel Nets, . 1 do.
Box, crib, &c (every 5) 2 men	Coghills, . . 1 do.	(used only in Londonderry district.)

* Eel nets at 20s. † No return received from this district for 1852. ‡ No return received from this district.

respect against this Bye-law, Rule, or Regulation, shall for each offence forfeit and pay a sum of Two Pounds.

Third.—All Persons are hereby prohibited from throwing into the Sea, on any Oyster Bed, or Oyster Fishing Ground, the ballast of any Boat, or any other matter or thing injurious or detrimental to the Oyster Fishery; and all persons acting contrary hereto shall for each offence forfeit and pay a sum of Two Pounds.

Fourth.—No Person shall, between sunset and sunrise, dredge for, take, or catch any Oysters within said Harbour, or any of the Estuaries of the Rivers flowing into the same; and every person acting contrary hereto, shall for each offence forfeit and pay a sum of Five Pounds.

RICHARD GRIFFITH, J. RADCLIFF, H. D. HARNESS,	*Commissioners of Public Works and Fisheries in Ireland.*
J. REDMOND BARRY, W. J. FFENNELL,	*Inspecting Commissioners of Fisheries in Ireland.*

Dated at the Office of Public Works, Custom House, Dublin, this Twenty-eighth day of October, One Thousand Eight Hundred and Fifty-three.

ABSTRACT of STATEMENTS from Boards of Conservators as

Number and Name of District.	General state of the Salmon and Inland Fisheries.	Whether the Take of Spring Fish this Year has been more or less productive, and the Prospects for present Season.	Whether the Take of Salmon in 1853 was more or less productive than in 1852	Average price of Salmon obtained by the Captors
1.—Dublin, . .	Favourable; progressing,	Yes; very good, . .	It has, . . .	From 10*d.* to 1*s.* 2*d.* per lb.
2.—Wexford, . .	Much improved, . .	Much the same as last; never better.	More so, . . .	1*s.* per lb., . .
3.—Waterford, .	The salmon and inland Fisheries present a wonderful improvement.	The take of spring fish has been better than for many years past; there is a prospect of abundance during the remaining part of the season	The year 1853 proved an improvement on the preceding one in the take of salmon	It was 2*s.* per lb., but is at present 1*s.* 2*d.* per lb.
4.—Lismore, . .	Very much improved,	Much more productive, with a prospect of productiveness for ensuing portion of the open season, much beyond late years.	More productive,	From 1*s.* to 1*s.* 4*d.* at present; in the early part of the season higher price was given
5. Cork, . .	A decided improvement in the take of fish in tideways, and a partial improvement in the fresh water.	Much more productive, and in the tideway very great.	Much more productive, .	1*s.* per lb., . .
6^1.—Skibbereen, .	No return received, .	—	—	—
6^2.—Bantry, . .	Most encouraging,	Expect an abundant quantity of fish during the remaining part of the season.	The take of fish was considerably larger last year	6½*d.* per lb. was the average.
6^3.—Kenmare, . .	There has been an improvement during the last three years	Spring fish are scarcely known in this district	It has been considerably more productive.	5*d.* per lb., . .
7.—Killarney, . .	Good, . . .	The take of spring fish more productive, prospects for the remainder of the season fair.	More, . . .	From 1*s.* to 1*s.* 2*d.* for spring salmon, and about 4½*d.* for grilse.
8.—Limerick, . .	Greatly improved, the improvement steadily progressing.	Much more productive; the prospect very good.	The take of salmon in 1853 was considerably greater than in the preceding year.	The average price this season is 1*s.* 4*d.* per lb.; lower than usual.
9.—Galway, . .	No improvement, .	More productive, yet small The total take, by rod and cribs, about 70 fish to this date.	Never was so unproductive.	Last year, from the scarcity, about 7½*d.* per lb.
10^1.—Ballynakill, .	Much improved, . .	The spring fish more productive; likely to be very productive	More productive by one half.	6*d.* per lb., . .
10^2.—Bangor, . .	Excellent, . . .	Not so much as last season; much better prospects	Much more productive,	4*d.* per lb., . .
11.—Ballina, . .	Slightly improving, .	Not more productive; too early to give an opinion as to the prospect for the remainder of the season.	Much the same, . .	Average about 4*d.* per per lb.
12.—Sligo, . .	The produce of the tidal Fisheries increased.	The spring fish this year is much more productive than last year, and a good prospect for the ensuing part of the season.	Much more productive than last year.	At the commencement they were sold at 2*s.* per lb., and afterwards at 6*d.* per lb.
13.—Ballyshannon, .	The appearance is good,	The spring fishing is better this season than last year, and there is every appearance of a good fishery.	The year 1853 has been better than the former.	About 4*d.* per lb., .
14.—Letterkenny, .	Improving, . . .	More productive, . .	It has been more productive.	About 9*d.* per lb., .
15.—Londonderry, .	—	—	—	—
16.—Ballycastle, .	Rather increasing, .	Rather better, a good appearance at present.	In the western portion of the district much better.	From 1*s.* to 7*d.* per lb.,
17.—Drogheda, .	—	—	—	—

Report of Inspecting Commissioners of Fisheries for 1853.

to the State of the Salmon and Inland Fisheries of Ireland.

Whether Salmon purchased chiefly for Exportation or Home Consumption.	The amount of Protection during Close Season of 1853, as compared with preceding year of 1852.	Whether the quantity of Breeding Fish observed in the Rivers has been greater or less than preceding Year.	Whether the quantity of Fry appearing in Rivers this Spring is greater or less than preceding Spring of 1853.	Suggestions from Conservators
Yes, double the quantity.	Considerable, when the small amount of funds are considered.	By far greater, . .	Greater, . . .	The conservators deem the consolidation of the Fishery Laws indispensable to the well being of the fisheries.
Seven-tenths for exportation.	Much more protection, and more effective	Breeding fish more than the last eight years	The fry far more numerous.	—
Nearly all the salmon taken is exported, the proportion purchased to that exported is 1 to 200.	Not much difference between this and preceding years	The number observed this year is greater than seen during any close season for many years.	Such large quantities of fry have not been seen for a long time in our rivers.	Not any.
For exportation, very few purchased for home.	The protection the same, conservators employ on an average 34 men during the season.	The breeding fish have been nearly double in number compared with preceding years.	It is rather early to report on the quantity of fry, but we have as many as we had at this time last year.	Alteration of season
Nearly all for exportation	More in spawning season,	Greater, . . .	Considerably more in the Lee, but the want of a pass in the Bandon weir forced the spawning fish to remain in the tideway, and below the weir, where the beds were broken up by the hauling of draft nets.	The total want of fish passes is greatly felt in the entire district
—	—	—	—	—
All for exportation,	The same as the former year, two water bailiffs	Greater, . .	The appearance of fry is greater this year	Not at present.
It is exported, the one third part taken for the last 5 years is purchased for home use, and two thirds for exportation.	No protection, except by the water bailiffs appointed by the Board, who are poorly paid, owing to the smallness of the fund, &c	There has been an increase generally reported	By much greater,	The conservators are of opinion, that the open season for net fishing in this district should commence on the 20th March, and end on the 20th September.
Purchased for exportation, scarcely one per cent.	About the same, . .	Greater, . .	Less, ...	An alteration in the close season as suggested in several memorials to the Commissioners.
Almost exclusively for exportation; very little obtained for home consumption.	Greater in a relative proportion to the amount of licence duty received in each of those years, or as £754 is to £662.	Much greater, . .	Considerably greater, .	None.
No exportation, .	Very similar, . . .	Much less, . .	Vastly more. . .	The artificial propagation promises to be most successful, and a source of increased supply to the river.
Home supply, none purchased for exportation.	Production equal to 1852,	Greater, compared to 1853.	Much greater, .	The rod licences and net licences should be raised.
Generally sent to Dublin, very little for home supply.	About six times the amount,	About four times the amount.	About ten times the amount.	It would, in the opinion of many experienced men (such as Mr. Savage), be very desirable to increase the amount of rods, nets, &c., so that active boys could be employed throughout the year.
They are purchased for exportation, but cannot form an estimate of proportion of home supply to that exported.	Same amount of protection each year, and the magistrates seem much more inclined to punish illegal fishers.	Rather less, and a great many very late in spring, from the dry weather we had in December, in which month there were scarcely any spawning	They are only now appearing, so that it is impossible to form a comparison with last year's.	In reply to this, conservators refer Commissioners to resolutions forwarded at various times, viz.—October 1, 1849, and July 18, 1850
Almost all exported by the proprietors.	Protection was carried out as far as the funds of the district would admit.	In some districts, .	—	—
The salmon in this district are exported, with a very small exception for home supply.	The protection last close season was better than any former year.	Greater, . . .	Greater, . . .	The conservators have no suggestion to offer.
All for exportation, .	The same, . . .	Rather less, . .	Less.	—
—	—	—	—	—
Nine-tenths exported,	Much the same, . .	In the eastern part greater.	Something greater, .	None.
—	—	—	—	—

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